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DESTROYING MT. MITCHELL

By RAYMOND PULLMAN

[The beauty of Mt. Mitchell, the highest mountain east of the Rockies, is being rapidly destroyed by the cutting of its fine timber. The lumberman cannot be blamed for cutting because the timber is ripe for market. The standing timber still to be cut is being protected against fire by the burning of the cut over area and thus the soil and the seed deposits are destroyed and the reproduction of the forest will be impossible. Ultimately the heavy rains will wash the soil away, the stream flow will be affected and floods will follow. Residents of North Carolina are alarmed and a movement is now on foot—late in the day it is true—to preserve some of the timber on the famous mountain.—Editor.]

THE magnificent spruce and balsam forests on Mt. Mitchell, the loftiest peak in the eastern United States and the hub of the Southern Appalachian range which rises to its greatest attractiveness in western North Carolina—"The Land of the Sky"—are being cut down and the mountain, it is feared, will become bleak and barren as a result.

Virgin stands of spruce and balsam trees which have taken hundreds of years to develop are being cut down without thought to future forest growth. Principles of forestry are not only disregarded in cutting the timber, but the lumbermen's contract gives them the authority to burn the slash behind them. The object of burning this heavy slash is to lessen the fire hazard which would exist if the slash were to stay on the ground near the standing timber or cut logs and perhaps be in danger of accidental firing. The result of the careless burning of the slash, however, is not only to kill off all of the young growth but to burn the soil which is formed of humus a foot or more thick in most places, and at the same time consume all the tree seed deposited in it.

The thinking people of North Carolina, particularly the business men of Asheville, deeply resent the devastation of the wooded slopes of Mt. Mitchell, and, in recent weeks, a movement has been started looking toward the preservation of the forests on its slopes through action either by the State of North Carolina or by the Federal Government. Not only are the citizens of North Carolina thoroughly aroused over the situation, but Uncle Sam is interested also in the preservation of the forests on the mountain. The cutting of privately owned timber on Mt. Mitchell has been accompanied by a number of fires on government National forest land, caused by sparks from the logging engines used in the lumbering operation. The government has already purchased large sections of land in the Mt. Mitchell area, in accordance with the Appalachian National Forest Act, and this government-owned timber is in constant danger because of forest fires starting on the cut-over and burned-over areas which have been left by the lumbermen.

Mt. Mitchell is to North Carolina and, in fact, to the whole eastern United States, what Pike's Peak is to the Rocky Mountain region and what Mt. Ranier and Mt. Shasta are to the Pacific coast. It is the highest peak east of the Rocky Mountains, rising to a height of 6,711 feet above sea level. It is one of the peaks of the Black Mountain range, so named because the trees which cover the slopes look black in the distance.

A SLOPE OF MT. MITCHELL.
HERE IS A CLOSE VIEW OF LOGGED LAND WHICH HAS BEEN BURNED OVER. NOTE THE SIZE OF THE TIMBER. THE CONDITION OF THE LOG IN THE RIGHT FOREGROUND INDICATES THE FIERCENESS OF THE FIRE.

The beauty and grandeur of this section of North Carolina has long made the region a mecca for tourists and each year the country is becoming more popular as a great National recreation ground.

Mt. Mitchell is about 30 miles northeast of Asheville, air line, and it is but natural that the citizens of this North Carolina city have been the first to protest against the lumbering operations which are resulting in denuding the mountainous slopes. At a meeting of the Asheville Board of Trade on November 28th last the leading citizens of the community discussed the serious situation which has been brought about by the cutting which has now been going on for several years, starting with the logging of the spruce forests from a large area on Clingman's Peak and now extending to the slopes of Mt. Mitchell.

The operations include the cutting of all spruce and balsam trees down to four inches in diameter. The cutting was confined to a large tract of 6,000 acres until recently but has now been extended to an additional 8,000 acres on the west slope of the mountain and the areas to be covered in the whole operation will aggregate 15,000 to 20,000 acres, and perhaps more. This means that much of the surface of the mountain sides will be denuded, leaving the cut-over area ready both for forest fires and the wash of the heavy rains which occur in this mountain region.

The relation between forest and stream flow is now well understood by most of the people of the whole United States, and especially by citizens of the Appalachian region, who have struggled for years to promote the preservation of mountain forests either by the State or National government in order to conserve and protect stream flow. Even the children of North Carolina understand how the heavily wooded mountain sides, covered with soil formed by the successive piling up of humus season after season, for hundreds of years, act as a great sponge to soak up the rains and allow the water to flow gradually into the streams which affect the conditions and life of hundreds of thousands of people living along the valleys.

The mineral soil in the Mt. Mitchell area is Carolina gneiss formation, so

CUT OVER AND THEN BURNED.
THIS IS A SAMPLE OF CONDITIONS ON MT. MITCHELL WHERE FIRE HAS SWEPT OVER LAND FROM WHICH THE TIMBER HAS BEEN CUT. REFORESTATION IS PRACTICALLY IMPOSSIBLE ON SUCH LAND.

named because of its extent in North and South Carolina. When the vegetal soil or humus is either burned or washed away, the mineral soil which is left is of a character which breaks up quickly and flows off into the streams, leaving bare, uncovered, rocky places everywhere.

In practically all of the lumbering operations which have been carried on on Mt. Mitchell, Clingman's Peak, and in the vicinity, no thought has been given for the future use of the land. The big trees have been cut so as to follow along the line of least resistance regardless of what they crushed and destroyed. The slash formed by the tops and branches is not piled in small, compact hillocks and burned as it is in many of the western forests, in such a manner as will do the least harm, but is left scattered six or eight feet high over broad areas.

The burning of this mass of material by the lumbermen in order to protect the standing timber and the logs means that all the new growth of trees is burned at the same time and that the soil also is burned to a depth of eight inches to a foot at times. In most such cases the home and permanent offices of the lumberman are generally located in another State and he has absolutely no interest in the mountain regions except in the profit which he will obtain from the timber and he naturally desires all the profit he can get. This, in a word, is the reason why the work is carried on in such a destructive manner without regard for the permanent interests of the people living in the State, and it is this condition which is arousing such protest.

The people of the southern Appalachian region have always recognized forest fires as one of the great curses of the country. The mountains have frequently been swept over by fires ever since the earliest days of the occupation of the region. Many fires occurred before the lumberman started his operations, but these have not been as destructive as those which have followed the lumberman because the burning of the slash has caused far more harm than the simple burning of standing timber.

The lumbering railroad has already been built to within a mile and a half of the summit of Mt. Mitchell and the large spruce trees which run from twenty inches to twenty-six inches, and sometimes to thirty inches in diameter—the best spruce timber in the eastern United States—are being cut down and hauled to a large band-saw mill at Black Mountain which is located on the Southern Railway, sixteen miles east of Asheville. The smaller spruce and balsam trees are cut and sent to the Champion Fibre Company's large pulp mills at Canton, which is just eighteen miles west of Asheville.

Such rapid progress has been made in clearing off the land that Clingman's Peak and a considerable area on Mount Mitchell today present a scene of utter desolation and ruin. Persons familiar with this section of the country realize that the destruction of the forests here is a more serious matter than in almost any other region. Forests cut down on the northwest Pacific coast, for instance, will quickly reproduce themselves, but the destruction of forests in the southern Appalachians and the usual burning over of land carries with it also the destruction of the soil and the seed deposits and reproduction becomes almost an impossibility.

That which nature required centuries to produce is destroyed by man in a few days because of the immediate profit which skinning the land will bring. The forests in which are the sources of many streams become rocky areas on which the heavy rains fall and rush off creating floods which destroy farms and interfere with the regular flow of the mountain streams, many of which are sources of great waterpower.

In the Mt. Mitchell lumbering operation the great skidways on which the logs are dragged to the railroad for loading and shipment form great gutters and down these gutters the waters from the rains rush in torrents and cut deep into the soil through to the red clay and the rock. Over the remainder of the face of the denuded mountain, soil washes badly after each rain, and, with its disappearance, the people of the State are losing all hopes of reforestation.

MT. MITCHELL INN, WIRELESS STATION AND FLAGSTAFF.

VIEW OF POTATO TOP.
TAKEN FROM THE LOGGING RAILROAD WHICH REACHES ITS LOWER SLOPES.

Mr. N. Buckner, Secretary of the Asheville Board of Trade, summed up the situation, when he said:

"We realize that timber, foliage, soil and water form the basis of all natural resources, and really govern the value of money. The man-made value of money depends absolutely on these three natural resources, and the preservation of the forests on the peaks of the Appalachian mountains, especially Mt. Mitchell and nearby peaks, is really a matter of vast vital concern to the people of the commonwealth of North Carolina and the whole United States. It is earnestly to be hoped that the people of the nation will rise up in a strong sentiment against the future forest devastation of the monarch of the east, Mt. Mitchell. Already forest fires have burned over the cut-over area and several crown or tree-top fires have resulted, and the whole area cut now presents a scene of unutterable desolation and blank ruins."

YOUNG TREES BURNED.
HERE IS A FINE GROWTH OF SPRUCE AND BALSAM DESTROYED BY A FIRE WHICH ATE DEEP INTO THE SOIL.

The Honorable Locke Craig, Governor of North Carolina, is one of the leaders in the movement to bring about some action which will check the destruction of the forests on Mt. Mitchell, and, in his address to the North Carolina Forestry Association, on January 13th, he dealt largely with the proposition that the State purchase the area on the top of Mt. Mitchell for the purpose of preserving at least a part of the virgin forest near and including the summit of the mountain. The Governor realizes that the lumber company, which has purchased practically all of the spruce timber on the Black Mountains including Mt. Mitchell, has an actual right, although, perhaps, not a moral right, to both destroy the forest and burn over the land. Although a man in a city is not permitted, by law, to set fire to his house, for fear that the conflagration would destroy adjoining property, a man owning forest land is permitted to burn this land over even though the burning will cause the destruction of the soil, flooding of farms below in the valley after heavy rains, and the destruction of other property.

"I tell you," said the Governor, "the lumbermen—and I am not criticising them, but us—the lumbermen are destroying North Carolina. We cannot expect them to sacrifice their business for the public good. They have bought that timber. They are entitled to every stick of it. If the people of North Carolina want to save it they must do so. They cannot expect the lumbermen to save it; they must save it themselves. They must save it from the fire that follows the lumberman.

"If I can lend any mite of influence to this movement for the protection of

our forests, I will do it; for in the protection of the forests we are protecting the fields, we are protecting the place where crops must grow, and where men and women must grow in North Carolina; we are protecting the whole State."

As the result of the widespread interest by the people of North Carolina in the preservation of the Mt. Mitchell area, under the leadership of Governor Craig and prominent business men, State Senator Zebulon Weaver has introduced in the North Carolina legislature a bill which provides for the purchase of a large area on Mt. Mitchell and the establishment of a park there so that the scenic value of the peak may be preserved for future generations.

The bill recognizes the value of Mt. Mitchell because of its being the most prominent peak east of the Rocky Mountains and because the region is the source of many important streams of the State, whose value will be damaged if the forests are cleared away and destroyed at the headwaters. State Senator Weaver's bill provides for the creation of a Mitchell Peak Park Commission, consisting of five practical men who shall be appointed by the Governor and who shall hold office until the desired area on Mt. Mitchell needed for a park shall have been purchased and a deed made to the State of North Carolina. The members of the commission will receive no compensation but their expenses.

A PICTURE OF DESOLATION.
HERE THE FIRE, FOLLOWING THE CUTTING OF TIMBER, HAS BURNED THE SOIL AND DESTROYED THE TREE SEED DEPOSITS.

The total amount to be expended under the act shall not exceed $20,000. The bill provides for the appointment of a valuation board of three competent men in all cases when the park commission and owners of the land cannot agree as to its value. While this bill will provide for starting the State in the purchase of the land for a Mt. Mitchell Park, it is believed by persons familiar with values in the vicinity that the limitation of the amount of $20,000 will not permit the accomplishment of as much as is needed at this time.

As is generally known the destruction of the forests of the southern Appalachians is not a new movement and it was because of conditions caused by deforestation in the whole region that the Congress of the United States four years ago passed the Appalachian National Forest Bill, providing for the purchase of lands necessary to preserve the regularity of stream flow. Under this act more than 1,200,000 acres of land have been purchased. Much of the more valuable timber land, however, is still in private ownership and only through State action or cooperation of State authorities with timberland

owners will this privately owned land be so managed as to reduce to a minimum the danger which follows all lumbering operations in this region.

As long as fourteen years ago the seriousness of the damage which was being done in the southern Appalachians was realized and at that time a thorough investigation was made of the forests, rivers and mountains of that region, by the United States Government. The then Secretary of Agriculture, James Wilson, twice visited the section and observed at first hand the destruction of the forests and the consequent enormous damage by floods. He examined many of the largest mountains, himself, and climbed Mt. Mitchell, the highest peak of the range.

The late Overton W. Price, associate forester of the United States Forest Service under Gifford Pinchot, was one of the men who made the 1901 investigation, and, at that time, he said: "The protection of the headwaters of important streams in order to prevent floods and perpetuate water powers, the preservation of a great natural health resort and of important agricultural resources are perhaps the most valuable results which would follow the creation and proper management of the Appalachian forests."

Few men in the United States know more about the topography and the geology of the southern Appalachian mountains than Arthur Keith, one of the experts in the United States Geological Survey, who has gone over almost every square mile of the country in the southern Appalachian region. In speaking of the great value of the forests in protecting the land, Mr. Keith has said:

"The chief agent which checks the removal of the soil by rains in this mountain country is the forest cover. Even though the penetrating roots and acids due to vegetation produce rock decomposition, these same roots, however, hold the loose material in place and hinder its tendency to slide down hill.

BOUND FOR A LOAD OF LOGS.
EMPTY CARS OF A LOGGING TRAIN ON THEIR WAY TO THE MT. MITCHELL LUMBERING OPERATIONS.

CLINGMAN'S PEAK ON THE RIGHT.
ON THE LEFT IS SEEN POTATO TOP WHILE IN THE CENTER IS THE LINE OF THE LOGGING RAILROAD RUNNING INTO THE HEART OF THE WOODS.

With its assistance loose soils are piled on slopes at angles fully double those which they could maintain unaided. The action of forests is great in another way: Loose materials are washed down hill during rainstorms by even the tiniest rivulets. In open fields these gather in a few minutes and form deeper and deeper channels with each succeeding storm, finally removing the loose material down to bare rock. This process is almost wholly prevented by the network of roots and the cover of leaves both living and dead, and the water seeps through the soil so slowly that it carries no sediment.

"The value of forest cover is illustrated better in the southern Appalachian region than in almost any other section. Streams which drain considerable areas of deforested land rise fast and soon become turbid with mud. Those which drain areas protected by forests rise much more slowly and by comparison the water could be called clear, except in the most violent storms. In addition to the loss inflicted by forests cutting upon the steep slopes themselves, great damage also results to the lands lying farther down the streams. The deep clay soil and underlying rocks form a sort of gigantic sponge which soaks up water when it is abundant. When the forests are stripped away the water collects and runs off with vastly greater speed and much evaporates, so that not only is less soaked up, but the discharge is very irregular and destructive, floods result, and therefore are wider spread. Thus, viewed from the standpoint either of utility or beauty, these unrivaled forests are the keystone of the arch."

The value of this testimony of one of the Government's trained geologists is understood by all persons who have ever visited the southern Appalachian region. People knowing what will happen when the forests are cut off are therefore getting almost solidly behind the movement to do what is possible not only to preserve the large area on Mt. Mitchell as a park, but, if possible,

MONUMENT TO PROF. MITCHELL.

THIS WAS ERECTED SOME YEARS AGO TO THE MAN WHO GAVE MUCH OF HIS TIME TO EXPLORING THE MOUNTAIN, WHO FIRST ASCERTAINED ITS ALTITUDE AND WHO FINALLY LOST HIS LIFE ON THE MOUNTAIN DURING ONE OF THE EXPLORING EXPEDITIONS.

PROF. MITCHELL MONUMENT DYNAMITED.

THE MONUMENT WAS BLOWN INTO THREE SECTIONS BY THE EXPLOSION AND EACH WAS SO BADLY BATTERED AND CUT THAT IT CAN NOT BE USED AGAIN. A NEW MONUMENT OF STONE IS TO BE ERECTED IN ITS PLACE BY THE STUDENTS AND FACULTY OF WEAVER COLLEGE, WEAVERVILLE, N. C.

HOMEWARD BOUND FROM MT. MITCHELL.

to bring about some form of co-operation between the State authorities and the timberland owners so that no man will be allowed to handle his land in a manner which will affect the welfare and destroy the property of his neighbor.

A mysterious and quite dramatic incident which followed the start of the movement to preserve the beauty of Mt. Mitchell for the people was the recent discovery that the monument marking the last resting place of Dr. Elisha Mitchell, after whom the mountain was named, had been blown up by dynamite. It is not known what was the motive for the act nor has any clue which might lead to the arrest of the vandal been discovered at the time of this writing. It may have been done by some drunken men carousing at the top of the mountain. The people prefer to believe that this is the case, and not that an agent of some of the interests which oppose the preservation of the forest committed the act.

Dr. Mitchell came from Yale to the University of North Carolina as a member of the faculty, and the monument to his memory on the top of the mountain was erected twenty-six years ago by the alumni of the State University. The monument was constructed of composition metal, and was cast in six sections and base. It was twelve feet high, and the base was thirty inches square. Dr. Mitchell, during the time he was a member of the University faculty, spent much time in exploring the mountains, and studying the geography, geology and botanical specimens of the region, and was killed on one of his daily trips, falling over a precipice. It was considered peculiarly fitting that his grave and the memorial monument should be located on the top of the mountain.

At a mass meeting held on the day following the blowing up of the monument, the students and faculty of Weaver College, at Weaverville, nine miles from Asheville by trolley, agreed to rebuild the monument in stone, in which will be set a tablet to be given by the North Carolina Historical Society. The rebuilding of the monument will begin in the spring.

THE MT. MITCHELL TRAIL

By H. W. PLUMMER AND N. BUCKNER

IN STARTING from Asheville to Mt. Mitchell over the trail which has been completed under the supervision of the Good Roads Association, one leaves by way of Merrimon Avenue and the fine new sand-clay road, up Beaverdam Creek to Craven Gap, where he will strike the Howland traction road, following this about two and three-fifths miles to Bull Gap. This is as far as one can go by wagon, the trail commencing at that point at the boundary of Dr. Ambler's property.

A ride of less than two miles along the trail brings one to the doctor's country home, Rattlesnake Lodge. From there to the top of Lane's Pinnacle, four miles, then on to Ivy Gap on the side of Craggy, about three miles; thence along the north side of Craggy to the south side of Craggy Pinnacle; around to the north of Craggy Dome, to the north of Bull Head, thence to Balsam Gap; through Balsam Gap to the sides of old Blackstock, one of the most attractive of the mountains; possibly on account of its forbidding aspect from a distance, being covered as it is with the black balsam, but on near approach furnishing a cooling and grateful shade, the trail over this mountain being cut out through the balsam timber. The mountain is so steep at this point that considerable engineering work was necessary to make the grade up the side of the mountain, but finally its crest is reached and followed for about half a mile. Then conquering Blackstock, the next hard climb is over Potato Top, then over Mt. Gibbs to Stepp's Gap, where a bold spring, the water as cold as ice, furnishes plenty of water for both man and beast; the last chance of watering your horse before climbing Mitchell, 6,711 feet. The distance from Asheville, 32 miles; to the top of Mitchell from Rattlesnake Lodge about 20 miles.

One of the interesting features of these mountains is that except in time of extreme drouth, one finds plenty of water along any of the trails; often on the highest mountains and almost at the very peaks fine springs are found.

With comparatively little humidity in the atmosphere, these towering peaks act as condensers and consequently rain is much more frequent than in the plateaus of low altitudes. The leaves and branches of the forest break the force of the raindrops; the shrubs, ferns and humus below catch the water and pass it slowly downward into the soil and rock crevices; and from this great natural reservoir weeks and even months later this water emerges into the numberless springs about the lower mountain slopes.

In riding along this trail at different points and especially through the Black Mountain, the views obtained are superb; without equal anywhere in the United States.

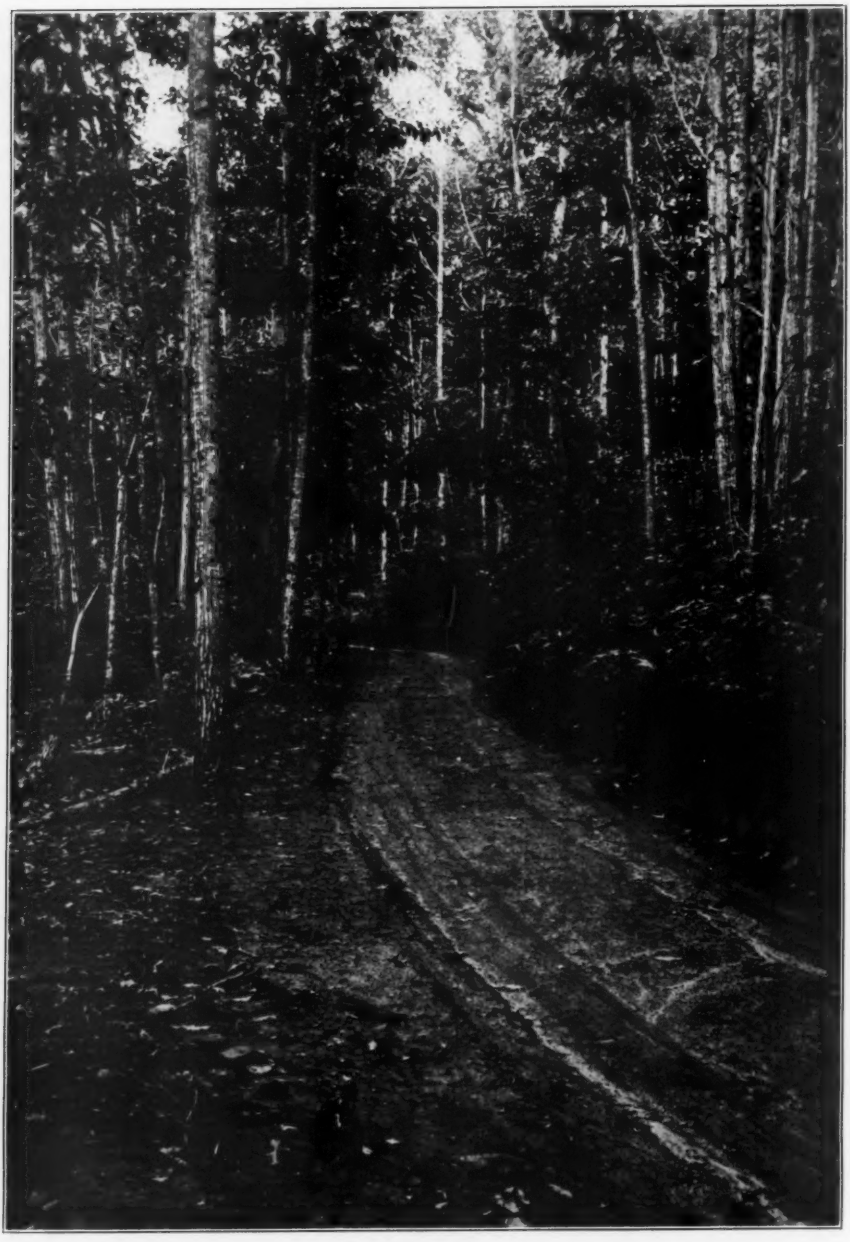
In some cases one's attention will be attracted to a nearby peak to the exclusion of everything else, while in other instances, an immense panorama will spread out, with a view of from 50 to 80 miles, according to atmospheric conditions, and comprising within the scope the Smokies, the Blue Ridge, the Blacks and the Craggies.

In making the trip the following mountains are crossed, sometimes along the side, sometimes over the very summits:

	Altitude, Feet
Richland Knob	4,979
Lane's Pinnacle	5,277
Craggy Pinnacle, about	6,000
Craggy Dome	6,105
Bull Head	5,985
Blackstock Knob	6,386
Potato Knob	6,419
Clingman's Peak	6,611
And on to Mt. Mitchell	6,711

Here we rest in a cabin now operated during the summer season by J. W. Dunne as Mt. Mitchell Inn. It is well,

Along the Mt. Mitchell Trail.



On the Way to Mt. Mitchell.

ALONG SUCH A ROAD AS THIS THOUSANDS OF SIGHTSEERS HAVE DRIVEN, RIDDEN OR WALKED ON THEIR WAY TO MT. MITCHELL.

however, for each man to provide himself with sufficient food for the trip.

Off to the north of Mitchell, the continuing range of Black Mountains comprise the Black Brothers, 6,690 and 6,620 feet, respectively, Balsam Cone 6,645 feet, Cat Tail Peak 6,609 feet, Potato Hill, 6,487 feet, and so on to the northeast to the Toe River valley.

These Black Mountains lying west of the Blue Ridge are a series of short ridges and form the watershed of the Toe River, Cane River, and with the Pinnacle of the Blue Ridge, Gray Beard, etc., the north fork of the Swannanoa River.

In President Roosevelt's message to Congress transmitting the message of the Secretary of Agriculture, appears the following: "The Southern Appalachian region embraces the highest peaks and largest mountains east of the Rockies. It is the great physiographic feature of the eastern half of the continent, and no such lofty mountains are covered with hardwood forests in all North America."

Along the southeastern margin of this southern mountain belt is the Blue Ridge proper, which, as it crosses North Carolina, is a fairly well-defined mountain range standing more than 3,000 feet above the sea and rising in four peaks to more than 5,000 feet, and in one (the Grandfather) to practically 6,000 feet.

Bordering this region on the northwest are the Unaka Mountains (or Smoky Mountains). Extending out from the two great mountain borders, the Blue Ridge and the Unakas, into the elevated region between them, and connecting them in places, are a series of more or less interrupted cross ridges which have altitudes comparable to, and in the case of the Black Brothers greater than those of, the Blue Ridge or the Unakas.

Some of these peaks are sharp, rugged and rocky; others like the "Bald Mountains" are rounded domes covered with grass and rhododendron; while still others, like Blackstock, Potato Knob and Mitchell, are heavily forest covered.

The haziness of the atmosphere which has found expression in the name "Blue Ridge" and "Smoky Mountains," often limits the distance of vision, but combines with the forest cover to soften the details and to render this southern Appalachian region attractive beyond compare.

In ascending any of the higher mountains, as Mount Mitchell, which, with its elevation of 6,711 feet, is the loftiest of them all, one may penetrate in the rich and fertile coves about its base, a forest of oaks, hickories, maples, chestnuts and tulip poplars, some of them large enough to be suggestive of the giant trees on the Pacific Coast. Higher up, one rides through forests of great hemlocks, chestnut oaks, beeches and birches, and higher yet through groves of spruce and balsam. Covering the soil between these trees is a spongy mass of humus sometimes a foot and more in thickness, and over this in turn a luxuriant growth of shrubs and flowers and ferns. At last as the top is reached, even the balsams become dwarfed, and there give place largely to clusters of rhododendron and many of them such as are commonly seen about the hills and valleys of New England and southern Canada.

In such an ascent one passes through, as it were, the changing of the seasons. Half way up the slopes one may see, with fruit just ripening, the shrubs and plants, the matured fruit of which was seen two or three weeks before on the Piedmont Plateau, 3,000 feet below, while 2,000 feet higher up the same species have now just opened wide their flowers. Fully a month divides the seasons above and below, separated by this nearly 6,000 feet of altitude.

Mt. Mitchell is not only the pride of North Carolina, but of the entire East inasmuch as it is the monarch of eastern mountain peaks. Its sides are covered with a great forest of magnificent balsam—great forest giants, straight as an arrow, and in many instances nearly 100 feet to the first limb. About two years ago a development, so called by financial interests, of this magnificent forest area of about 9,000 acres was begun. As a result erosion of this mountain peak has already started to a considerable extent.

PISGAH MOTOR ROAD.

HERE IS A FINE WELL-BUILT AND WELL-PROTECTED MOTOR ROAD LEADING TO THE SUMMIT OF MT. PISGAH. NOTE PISGAH'S WELL-WOODED SIDES.

The logging road has been extended to within a mile and a half of the summit of Mt. Mitchell, approximately 1,000 acres of spruce and balsam have already been cut off and most of the cut-over land has been fire swept several times, giving the appearance of a vast, desolate waste. Unless prompt measures are taken by the Government of the United States or the State of North Carolina, this great king of mountain peaks will soon be denuded of its magnificent balsam and spruce forest, destroying watersheds of infinite value from these mountains to the Atlantic Seaboard east, and to the Mississippi River and Gulf of Mexico west.

While the agitation for the Appalachian Park has progressed during the past nearly ten years to the extent that the Government has already purchased in North Carolina more than 225,000 acres of land, it would seem that strenuous efforts should be made by the people of the East to preserve the wonderful balsam forests of Mt. Mitchell to the people of the Nation, as a part of this Appalachian National Park.

Many millions of dollars are spent annually by American tourists in Switzerland, where more than $164,000,000 are invested in hotels alone. This will give some faint idea of the benefits that would accrue to the eastern mountain section of the United States as a country if these mountains were properly developed into a great park threaded with good roads, as is the case in the National Parks of the West.

Mount Mitchell can be reached over the Southern Railway or by motor to Black Mountain, where guides can be procured, and thence over the trail sixteen miles, afoot or horseback. Or to Graphiteville, 23 miles from Asheville by rail, thence by walking trail, constructed by the Government, to summit of Mt. Mitchell, a distance of twelve miles.

FORESTRY EDUCATION IN VERMONT

ACCORDING to the new curriculum of the University of Vermont and State Agricultural College, Forestry is made a required subject for all agricultural students. All sophmores are to have a half year's course in Farm Forestry, which may be followed by a two week's forestry camp, and other courses. The University of Vermont has been modest in its aims, and has never attempted to establish a forestry school, but so far as is known, it is the first agricultural college to require forestry of all students. It does this believing that its graduates will need a certain amount of forestry whether they become farm managers, teachers of agriculture, or pursue other lines of agriculture. Those intending to become professional foresters are encouraged to continue their studies at a technical forest school. It is interesting to note, in this connection, that an elementary course in forestry is also given at the state agricultural school at Randolph, Vermont. The forestry class of thirty wide awake boys recently visited the Downer State Forest, and inspected the four-year-old plantations of white, Scotch and Norway pines, and Norway spruce, as well as the forestry cuttings.

The Agricultural College and Experiment Station have just completed a forestry exhibit for the San Francisco Exposition, illustrative of the extension work in forestry, and the various lines of forest investigations, including the establishment of permanent sample plots for the accurate study of natural reproduction.

PLANTING TIME AND CARE OF TREES

By S. B. DETWILER

THE time to plant is either late fall or early spring. Usually the amateur gets better results with spring planting. Fall planted evergreens should be transplanted about the middle of September. Broad-leaved trees should be transplanted only when the buds are dormant. Trees transplanted from the woods should be seedlings. Forest grown trees are more successfully transplanted by cutting off the roots several feet from the trunk a year or more before the tree is moved. This enables the tree to develop an auxiliary root system; it is also well to prune back the top at the time the roots are pruned.

Nursery grown trees are best for shade tree planting on account of their better root development. A tree 1½ to 2 inches in diameter one foot above ground is large enough for street planting and smaller trees are cheaper and may be used to advantage for lawn or roadside planting. Because of the better proportion between roots and top, small trees usually outgrow larger trees planted at the same time. The trees should have a compact root system, a straight trunk and a well-balanced top.

Tree pedlars should be held in suspicion.—Trees should be purchased from reliable nurserymen of good reputation. If you are not acquainted with a reliable firm the American Forestry Association can supply you with lists of reliable dealers.

Trim off all torn or broken roots and branches with a sharp pruner before planting. Street trees should have the lower branches trimmed to a height of 7 to 9 feet from the ground. When a tree is transplanted, a large part of the root system is cut off, and it must start new feeding roots before it can establish itself. Unless the top is severely pruned, proportionately to the root system, excessive transpiration from the leaves is very apt to kill it. The trees should be free from scars and bruises due to carelessness in handling.

If the tree is purchased from a nearby nursery, as is most desirable, have it delivered for planting on a cool or cloudy day. In every case the root system must be protected *at all times* from the sun and air, from the time it leaves the nursery until it is planted. Moist blankets or a canvas wrapped tightly around the roots will give adequate protection.

Preparing the tree for the hole.—Several weeks before planting the hole for street planting should be dug, 5 to 7 feet long, 3 or 4 feet wide and about 3 feet deep. These holes should be covered to prevent people falling into them. A few days before planting, the hole should be partly filled with the best soil available, and well packed. A cubic yard of rich loam, well pulverized, should be placed close at hand for use when the tree is set. In lawn planting smaller trees are usually planted, and the hole may be reduced in size. If the top soil is good, it may not be necessary to bring in other soil, but in *every case it will pay to use the very best soil* and plenty of it. Fresh manure should not be used, as it is liable to burn the roots.

Planting.—The tree should be planted slightly deeper than it stood in the nursery, and the roots spread out naturally, without twisting or crowding them. Fine soil is sifted between the roots and worked under and between them, filling every space. The tree should be held upright during planting, by an assistant. Working the tree up and down and sidewise aids in packing the dirt firmly about the roots. The soil is packed in layers by trampling, care being taken not to break or tear the fine feeding roots. The top 3 or 4 inches of soil is thrown on loosely, to act as a mulch. The tree may be thor-

oughly watered before the top soil is applied. The tree should stand midway between the curb and sidewalk, perpendicular and in line with other trees.

Tree Guards.—Young trees, especially street trees, should be protected and supported by tree guards placed around them immediately after planting. For street trees, a wire or metal guard is most economical. For lawn trees, a single stake firmly driven into the soil is usually sufficient. Leather or canvas straps should be used to attach the tree to the support.

Cultivation.—Cultivation of the soil for three feet around the tree is beneficial during the first years of growth. Loosen the top soil with a spade or hoe a sufficient number of times during the season to keep down weeds and grass. A mulch of leaves or manure in the fall retains moisture and acts as a fertilizer when spaded under. During the hot, dry periods of the summer months, watering should be done once or twice each week, not oftener. The feeding roots which take up the moisture are located at a distance from the trunk equal to the length of the branches, and the water should be applied liberally, but not too frequently, to these feeding roots.

CARE AND REPAIR OF SHADE TREES

Training, trimming and pruning.—Low branching will cause more rapid growth in trunk diameter. The lower branches should be pruned for shade and street trees at intervals of a year or more, as they interfere with street traffic, until a clean stem of ten or twelve feet is reached. Lawn trees require little attention, since low branching, and unsymmetrical form give them character. If possible, trees should be left with single leaders, since crotches are likely to split in later years. If two or more main stems develop, leave the central stem and severely trim or entirely remove the others. When it is necessary to restrict the spread of trees within certain bounds on narrow streets and roadways, the ends of the branches should be shortened so as to develop a compact symmetrical crown. Any time after midsummer is suitable for pruning. Shaping can best be done while the foliage is on the tree. Heavy pruning is better done in fall or winter.

Old, neglected trees should first have all dead and imperfect limbs removed. Thin out dense tops by leaving main limbs and the branches immediately radiating from them and limit cutting to the third and fourth divisions in branching. As far as possible preserve the character and natural shape of the tree, making the finished tree look as if no limbs had been removed. Start pruning at the top of the tree and work downward. All cuts should be made smooth, close to the base of a limb, and parallel to the axis of the stem. At all times avoid unnecessary wounds by cutting or tearing the bark in making the necessary cuts and in climbing the trees. The surface of scars should be smoothed and painted with a mixture of two parts coal tar to one of creosote. It is safer to follow this with a heavy coat of coal tar (the kind used for roofing is best). Large scars should be recoated every few years.

Control of insects and fungus disease.—Leaf-eating insects can usually be killed by spraying the foliage with a solution of arsenic in some form. Success depends upon the poisonous quality of the insecticide and upon the time and manner of spraying. The principal leaf-eating insects are; Tussock moth, Gypsy moth, Brown tail moth, Fall webworm, Bag worm, Elm leaf beetle. Sucking insects are usually destroyed by contact poisons such as kerosene emulsion, whale oil soap and lime—sulphur wash which close up their breathing pores. Important sucking insects are the Cottony maple, woolly maple, San Jose, scurvy, and oyster shell scoles, and plant lice. Boring insects such as the leopard moth, maple borers and bark borers, are more or less successfully combated by running a wire into the burrows, cutting off infected branches and twigs, injecting carbon bisulphide into the galleries. Fungus diseases affect leaves, branches, bark, sapwood and heart wood and roots, but are less serious than injuries by insects, except the chestnut blight for which no remedy is known. Diseases

of the leaves may usually be controlled by proper spraying with a good fungicide, such as Bordeaux mixture. Fungi affecting the wood usually gain lodgment in wounds. They may be excluded by proper care, and when present may be checked by tree surgery methods. To successfully combat tree pests of any description requires special methods adapted to each particular pest. Detailed information should be obtained from city, state or national authorities. The American Forestry Association will refer inquiries on these subjects to the proper officials, on request.

Tree surgery consists in cutting out the diseased parts of trees and filling the cavities with cement so that they are water-proof. All decaying, discolored, water-soaked wood should be removed, with gouge, chisel and mallet, until only sound, uninfected wood is exposed. The bottom of the cavity should be shaped so that if water were thrown in the cavity it would promptly run out. The top and bottom of the cavity should be V-shaped rather than square or rounded, as this aids proper healing. The interior of the cavity should be sterilized by thorough painting with coal-tar creosote, followed by a heavy coating of coal tar. Fill the cavity with mortar made of one part cement to three (or less) parts sharp sand, and bring the filling to a smooth, water-tight finish, exactly even with the cambium (growing layer of the tree). Before filling large cavities, flat-headed wire nails 2½ to 3 inches long are driven about half their length into the interior, to hold the cement. The cement is reinforced with iron rods and cross bolts. The filling is then built up in blocks of 8 to 12 inches, each block being separated by sheets of heavy tar paper. Large solid fillings of cement are apt to be cracked when the tree sways in the wind. When it is not advisable to go to the expense of filling, much good is done by treating the cavity as recommended above, following with an extra coating of tar. Split crotches should have all decayed wood removed from the split, and creosote and tar applied. Bring the limbs back to their proper position, using rope and tackle if necessary, and hold them in place by means of bolts through each limb, connected by chains. Countersink the head of the bolt. Thoroughly coat with tar the cuts made for the bolt, and the edges of the crack. Cavity filling is advisable only when the tree is a highly valued specimen. Old, unsightly cripples and trees of poor species are much better taken down and replaced with new trees of desirable kinds. The need of tree surgery at a future time will be very largely removed by promptly attending to the fresh injuries of today.

Beware of fake tree doctors.—There are reliable tree surgeons, and many who are not. The owner should investigate before employing outsiders to repair his trees. If the owner chooses to do the work, it is mainly a matter of common sense to make needed repairs. However, if it is desirable to employ an expert to do the work, the owner should investigate his standing before employing him, and should closely superintend the work to see that it comes up to the specifications of the written contract.

Coordination of effort is necessary in any community, large or small, to obtain the greatest beauty and benefit from shade trees. In this way it is possible to secure uniformity in the use of species, proper pruning, and efficient control of insect and fungus invasions. A number of States have laws governing the planting of street and roadside trees. If there is no Shade Tree Commission or City Forester systematically developing the tree welfare of your community, interest yourself in forming a local forestry improvement association. If such an organization exists, do all you can to make this work successful by fully cooperating with it.

To Distribute 1,000,000 Trees

The State School of Forestry at Bottineau, North Dakota, announces that it will have one millon trees for distribution to the citizens of the state during 1915.

READY FOR A HIKE INTO THE WOODS.
THE BOYS CARRY BLANKET ROLL AND KIT AND ARE EQUIPPED FOR CAMPING OVER NIGHT. THE SCOUT MASTER IS IN THE FRONT ROW.

BOY SCOUTS AND FORESTS

By K. W. WOODWARD

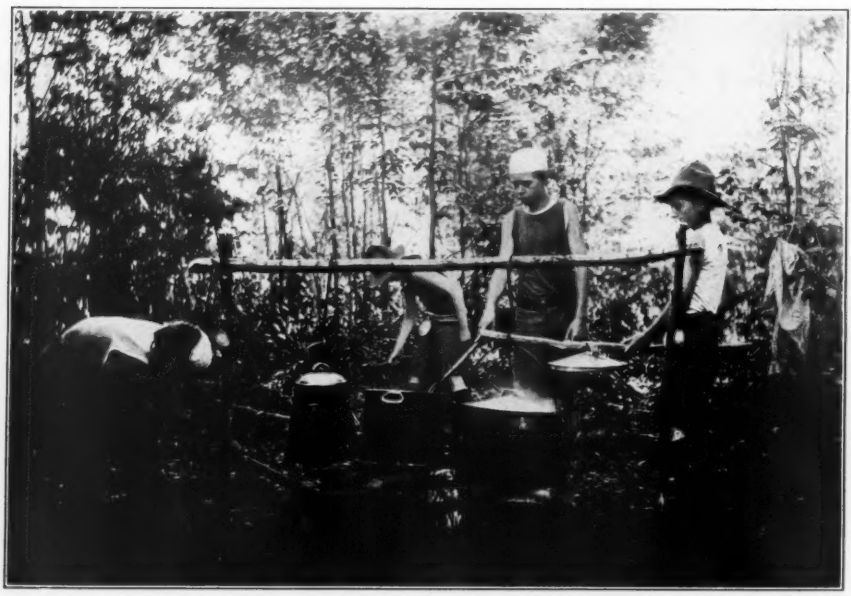
ROBIN HOOD is the prototype and patron saint of the Boy Scout. What Scout of today would not give his most precious possession for the privilege of spending a day with the Merry Men of Sherwood Forest? Astir with the earliest dawn in order to shoot with bow and arrow the deer that formed their main food their whole day was a round of outdoor activity in which any healthy boy would be glad to share. And at night around the blazing camp fire would be told tales of daring in the hunt and the meting of rough justice to tyrannous knight, grasping bishop, or thieving serf which would thrill him with eager desire for emulation. The mere mention of Robin Hood calls up visions of green forest and deeds of valor chivalrously undertaken to right some wrong. Fortunately, too, our own American history is full of names that carry down to the present the traditions of the Merry Men of Sherwood Forest. Daniel Boone, Davy Crockett, Andrew Jackson and Abraham Lincoln were all men of the woods.

It is the lives of these frontier heroes that Boy Scouts seek to emulate in their hikes in the woods.

Even a short trip may be made replete with inspiration to fuller knowledge and that self expression which leads to better self control. There are grasses, herbs, shrubs and trees to become acquainted with, each one with its individuality and uses. If he is permitted to hunt he learns the habits of a few game birds and animals, but if a camera or pair of field glasses are his weapons his interest is broadened and

THE ARRIVAL.

REACHING THE CAMP GROUND THE BOYS ARE SOON READY TO PUT UP THEIR TENTS AND ARRANGE THEIR QUARTERS.



THE COOKS GET BUSY.

THE FIRST WORK IS TO BUILD THE KITCHEN AND SET THE POTS TO BOILING FOR THE AVERAGE BOY SCOUT ALMOST DOUBLES HIS USUAL GOOD APPETITE WHEN HE GETS INTO THE WOODS.

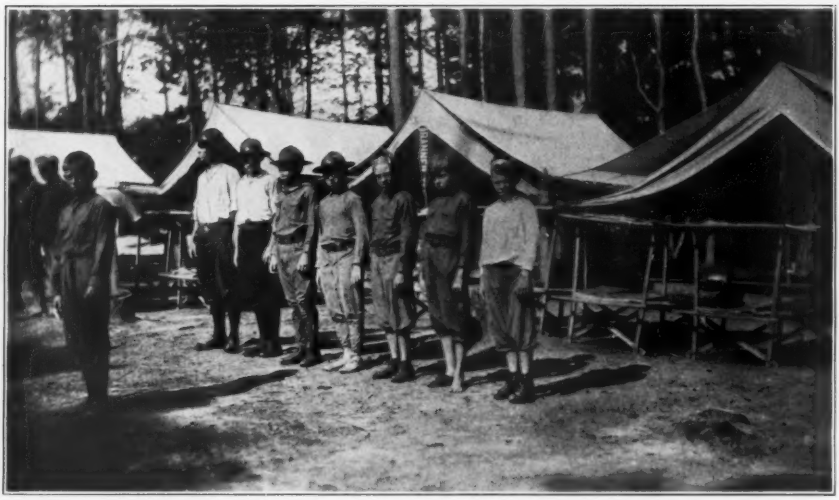
THE CAMP IS READY.
THE TENTS, WELL FLOORED TO PREVENT DAMPNESS, ARE UP AND THE COSILY BLANKETED COTS ARE READY TO GO UNDER CANVAS.

includes everything that creeps or flies or runs. A covering of new snow becomes a fascinating book upon whose pages are traced the pranks, the squabbles and struggles of the woods folk. Then, too, there are numerous games to which the woods form the best setting. The pursuit of big game by marking the trail with tracking irons fastened to the shoes of the boy chosen to represent the quarry, limitless variations of the reenactment of our ancestor's struggles with robbers and Indians, and minature models of the war games played by the army make up the admirable collections of contests compiled for the use of Scouts by the National Headquarters.

It is the chase, the mimic warfare with robbers or Indians, the hidden camp, and roaring fire that appeal to the boy's imagination and develop in him the rugged primitive virtues upon which the superstructure of our modern life is built.

The permanent camp is even better for this purpose than the short hike and every Boy Scout organization has come to realize that camping out in the woods gives an opportunity to educate, or draw out, the boy in a way that no other surroundings will. Scout and Scoutmaster come closer together and gain mutual respect in the common performance of camp duties and pleasures. As an illustration of how permanent camps are conducted in the woods the camp maintained by the Washington Branch may be cited. This was located on the shores of Chesapeake Beach in a grove of timber. The organization owned a tract of 50 acres at this point which furnished an excellent place for the Scouts to be given practical instruction in the identification of tree species and the tending of woods. Another year it is planned to start a nursery in order that the boys may learn something about setting out trees. Nearly every local organization now maintains a similar camp, and although a stretch of water in which the boys can swim is essential the presence of woods is equally important. There are so many Scout activities which can only be carried on in a forest that a Boy Scout camp is always located as a matter of course in or near woods.

Another illustration of the large rôle which life in the woods plays in the scheme of Scout instruction is indicated by the first and second class Scout



READY FOR MORNING INSPECTION.

requirements. These include cooking, swimming, tracking, woodsmanship, a small amount of astronomy, tree identification and a knowledge of animals and birds. They are, in fact, merely the minimum tests which a woodsman has to pass. In order to encourage the boy to keep on with the work of equipping himself for life in the woods, merit badges are offered in the following subjects—archery, astronomy, camping, cooking, first aid, horsemanship, path finding, personal health, swimming. Every thoroughly equipped woodsman is an expert in practically every one of these subjects. Through the knowledge of this kind, Scouts like Daniel Boone and David Crockett were able to outwit the Indian and win for us the country west of the Alleghany Mountains.

A HIKE THROUGH THE WOODS.

TRYING TO MAKE FIRE BY RUBBING TWO STICKS TOGETHER.

But it is not only as a place in which to seek adventure and learn hardihood that the forest interests the Boy Scout. To it he goes when he wishes to hunt, fish or trap. In other words, it is a storehouse from which he may gain a very fair living if he has the wit. Even in woods from which game has been

THE HIKERS ON THE MARCH.

CLIMBING THE FLAG POLE.

exterminated there are berries and nuts which make it worth while for him to spend his spare time there. Furthermore, there is nothing as interesting to a boy as the construction of a log cabin and for this purpose he must of course go to the forest for his material. Many Troops have constructed cabins in which they hold their meetings.

Very early in his school work the normal boy takes up carpentry. This

Posing for Their Photograph.

shows him another use for which he is indebted to the forest. Even a little work with the saw and plane soon brings out the wide variations in the qualities of different woods. All wood is wood to the youthful carpenter who has received no instruction, but a Boy Scout is early taught that the hardwoods while pretty to look at when polished are relatively unimportant. For his camp fires, boats, and log houses softwoods are better.

If he is fortunate enough to be in a community where he can go out and cut his own material he can carry through from the stump to the finished product the process of shaping the wood for the end in view.

The following merit badges, whose purpose is to encourage the boy to make himself thoroughly familiar with the resources of the forest, are offered to first class Scouts for special proficiency: Angling, tree study, carpentry, craftsmanship, marksmanship, pioneering, stalking and taxiderming. All of these studies may be best practiced in the woods or on raw material derived from the forest.

Since the boy repeats in his development the history of the race his interest in the forest is an evolution. Like the pioneer and frontiersman he regards the woods at first merely as a place in which he may seek adventure. Later he comes to realize that the forest yields many products which can be made useful. In other words, he passes from the point of view of the frontiersman to that of the lumberman. But the Boy Scout organization has been wise enough to see that these two points of view do not represent the highest type of interest in the forest. Merit badges are offered in agriculture, art, conservation, forestry and surveying through which a Scout may learn something about conservation of game and fish, water, timber and the beauty of the forest. Some branches of the organization have even made this interest concrete by calling in the assistance of the boys in fire fighting. The State of Michigan has made a notable contribution in this way and annually employs a large number of Boy Scouts during the fire season to help in the protection of its forests from fire. Besides the active aid which the boys give this campaign has also had the good effect of showing that there is something more worth while doing than setting fires to the woods, a com-

mon pastime of all boys a few years ago. Other ways in which the Scouts have aided directly in the conservation of trees are the recent census of shade trees in New Jersey and the help which they have furnished in protecting the street trees in Pittsburgh. The planting out of seedlings either for forest purposes or as shade trees is likewise a field in which Boy Scouts have done much.

It will readily be seen that the boy who enters the Scout organization, passes through the three stages of tenderfoot, second and first class Scout and then tries for the various merit badges referred to above, can attain an excellent grounding in the ways of taking care of himself in the woods, and a thorough understanding of the importance of the forests in our national life. In fact, if he cares to do so he may easily equip himself as well as most Forest Rangers are when they start to work in the woods. Should he decide to take up forestry as a profession he will find himself far ahead of young men who have not had the advantage of a Scout training. In case he chooses to go to one of the higher professional schools he will have a foundation upon which to build a solid superstructure of technical knowledge.

TOWNSHIP FORESTRY CLUB

By GEORGE B. COBB,
Secretary Forestry Club, Tryon, N. C.

TO TRYON, Polk County, North Carolina, belongs the distinction of organizing and putting into practical operation the first township organization for the express purpose of preventing forest fires, and conserving and perpetuating the timber tracts of the old North State. The State has, in years past, suffered greatly from fire, insect pests and blight. Now special committees of this club are successfully safeguarding, and at very small cost, the trees of the county from such ravages.

This Forestry Club, organized more than a year ago, has over sixty active members.

A chief warden directs the fighting at all forest fires in the township, which, as soon as discovered, are reported to him by telephone or signal. With several lookout stations established in the "Thermal Belt" section along the south side of the Blue Ridge range of mountains, and across the Pacolet and Skywicker Valleys below, practically overlooking the entire area of the township, it has been possible to cope successfully with every fire that threatened in 1914.

The organization of this club was the outcome of an idea advanced by George B. Cobb Editor of *The Polk County News*, Tryon, N. C., in an editorial published in October 1913, enumerating the many benefits forest landowners would realize from the systematic cooperation of all interested. The idea met with universal approval, resulting in organization of the Club the following November.

The officers are: E. R. Rankin, President; W. B. Stone, Vice-president; W. H. Stearns, Treasurer; George B. Cobb, Secretary; C. M. Howes, Fire Warden.

Standing Committees of three members each for Forest Protection, Forest Preservation, Forest Perpetuation, and Finance, complete the organization.

This small Club has proven so satisfactory to all interested, and its work so efficient, that it has met the approval of the State Forester and The North Carolina Forestry Association, which advocate the formation of like township organizations for forest protection, in place of County organizations which in many cases have proven too large, and too scattered for quick, effective work in forest fire fighting.

Through the efforts of this Club the Commissioners of Polk County offer a standing reward of $50.00 for the apprehension and conviction of any person setting fires in the open, contrary to the laws of the State.

THE JUNIPERO OAK

By ALLEN HENRY WRIGHT

THERE have been many famous trees in history, which have become as shrines to many enthusiasts. Thus we have the trees which are associated with the names of George Washington, William Penn and others. Overlooking the ancient city of Smyrna, on Mt. Pagus, there stands a tall cypress-tree which is said to mark the spot where Polycarp, one of the early Christian fathers, was burned at the stake in the year A. D. 168.

In the old city of Monterey, California, which is replete with buildings and things of historical interest, there is to be found, in the rear of the San Carlos Mission, all that remains of an ancient oak. An inscription on a stone at the base reads: "The Junipero Oak. At Monterey June 3rd, 1770, the ceremony of taking possession of California for Spain was enacted by Father Junipero Serra under the shade of this tree. Placed here for preservation by R. M. Mestres and H. A. Greene, 1905."

Padre Junipero Serra was the leader of the Franciscans who estab'ished and maintained the chain of Missions along the Pacific coast, starting with the Mission of San Diego de Alcala, near the present city of San Diego, California, in 1769.

At San Diego there still stand some of the palms and olive trees which were planted by the padres. Beautiful pepper trees are also features of the landscape which date back to their time.

Photo by A. H Wright

THE JUNIPERO OAK AT MONTEREY, CAL.

FORESTS AND GAME PRESERVATION

By OTTOMAR H. VAN NORDEN, *of the Camp Fire Club of America*

IT HAS been said in jest of the Camp Fire Club of America apropos of our Game Protection activities, that "we are an association of criminals organized for the prevention of crime." Perhaps it is that our too short days on wilderness trails, beside limpid lakes or under beetling mountains has shown us what is the real spirit of the wilderness and has made us eager missionaries in the cause of the spreading of the gospel of the forest.

Three centuries ago our ancestors found on coming to this continent a vast forest stretching unbroken from the Atlantic to the Mississippi. They had come to make this new land their home and the great forest was a serious obstacle—to be cut and girdled and burned—that the land might be cleared.

When they became involved in warfare with the Indians the forest presented a new menace—it furnished a perfect cover for their enemies. And so they destroyed it, secure in the knowledge that it was inexhaustible, and with it in the same manner they destroyed its wild life—its myriads of birds and mammals.

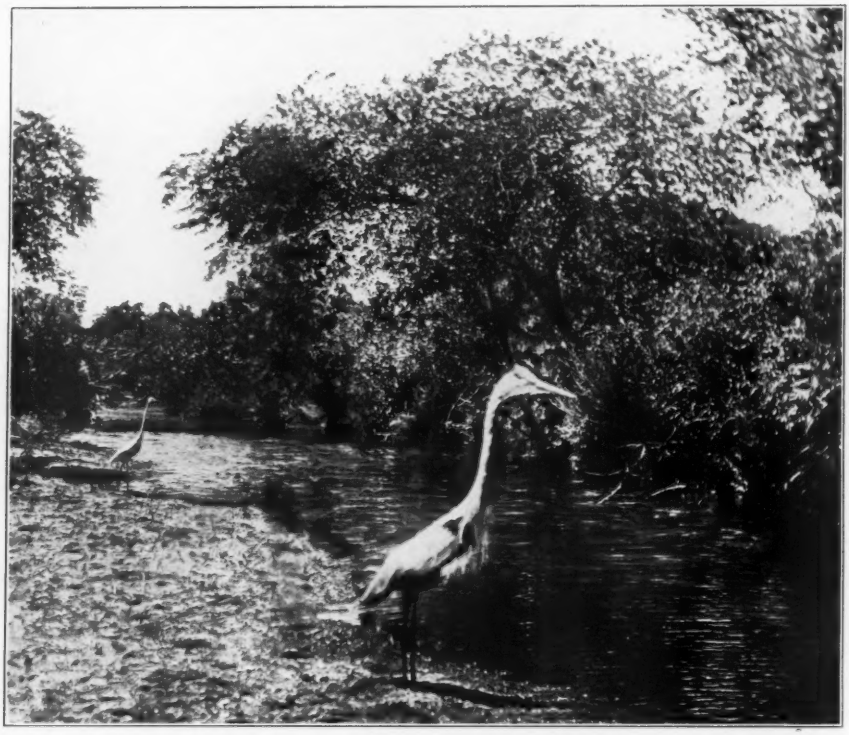
Later, with the growth of population, there came a demand for lumber and then followed that orgy of destruction of the 19th century, when we used a little and wasted much, when we lumbered without thought of the future, and the always ready fire closely followed the lumberman, and left desolation.

So now in this 20th century our game and forests are about gone. Like the Prodigal we have spent our patrimony but unlike him we have no indulgent father to divide our older brother's heritage with us. We must eat the husks.

Have you ever considered how fortunate for us it was that our ancestors found a bleak coast, a dark primeval forest, and resourceful and dangerous enemies instead of sunny and fertile

IN THE MOUNTAIN SHEEP COUNTRY.

PORTIONS OF THE NATIONAL FORESTS IN THE WEST ARE IDEAL FOR BIG GAME HUNTERS AND WILL BECOME MORE SO, AS IT IS PLANNED TO MAKE SECTIONS ABOVE TIMBER LINE WILD GAME REFUGES.



GREAT BLUE HERON AND WHITE EGRET.
THE HERON IS IN THE FOREGROUND, THE EGRET FURTHER UP THE CREEK WHICH IS WEST CACHE CREEK ON THE WICHITA NATIONAL FOREST, OKLAHOMA.

plains? Do we fully appreciate what we owe to that great wilderness? For a full century and a half our forefathers battled with it for mere survival, for 150 years they developed courage, resourcefulness, hardihood and individuality, and without a Moses to lead them on or a daily shower of manna from heaven to feed them, they shook off the habits of centuries of European convention and developed the American spirit that spoke in the Declaration of Independence, in the War of the Revolution, and that in another short hundred years conquered and settled this great country. For all that wonderful achievement, for our very American nation today, we must thank the wilderness.

But today the great forests are gone. We are city dwellers. Instead of our noble frontier we have the tenements and the slums. Instead of the noble Indian we have the degenerate gun man. We face many serious social and economic problems which must be solved.

Are we developing the high moral standards, the individualism, the courage and self reliance which as a nation we must have to solve these problems?

Certainly we need the qualities of Washington and Lincoln, of Daniel Boone and Davy Crockett,—and they were educated in the wilderness school.

Our answer is this: We must preserve some real wilderness, in parks of course, for our coming generations. We must give them a chance to know and love the real woods. As far as we can we must reintroduce them to the out of doors and instill in them and keep alive the spirit and love of the wilderness.

You may well wonder what forest and game protection has to do with

history, and sociology and economics. It has much to do. We must have the incentive to go to the forest, and there we must have the inspiration of the woods, natural and beautiful; of the wild life as it once existed when the forests were primeval. No artificial forest this; no dollars or cents in it—just nature at her best without the regulations and improvements of man.

We believe in scientific forestry. There are many millions of acres of denuded lands within our borders which must be replanted. There are many other millions of acres of forests which must be cut, in order that the demands of commerce may be met, and those lands must be so lumbered that the cover shall be preserved, that reproduction may be assured and that fire may be controlled.

We, as a nation must so develop our lumber resources that we shall supply our own wants and export—if we find a market. That is a business proposition and we believe in it as business men. For those lands let us utilize the best and latest practice in silviculture. Let us develop the highest efficiency upon them so as to secure the greatest yield, as we would in a silk factory or a steel mill.

But let us remember that such tracts of lands are tree orchards, not parks, and that they are operated for commerce and not for inspiration.

WE WANT REAL WILDERNESS PARKS

Remember what I have said about the old wilderness. Remember what I have said about the sturdy national character that wilderness built, and then you will know why we want some tracts of forest land to be natural in both trees, scrub and wild life. Why we want forests where birds and game can live; where the trees grow to maturity and die and fall; where the moss on the rotted trunks, the maple scrub, the poplar and the alder furnish food to the deer and moose and beaver and the decayed branch furnishes a home and food to the woodpecker and the chickadee.

A real forest is as much more than a collection of trees as a city is more than a collection of houses. The life of a city is in its population, without which it would be a mere empty skeleton. But the teeming activities of a city, with all their complex interrelations, are no more intricate and wonderful than the life of a natural forest with its myriads of creatures large and small deriving their life from that forest and doing their part in its support and maintenance.

Take for example an eastern forest, such as our old North woods. The trees, though all important, are merely the framework around which the complex structure is built.

Its foundation is in the deep moist duff, rich with the accumulation of ages of life and death and decay, and from this foundation springs, not only the trees, but the undergrowth which is as much a part of the forest as the leaf cover overhead. For here in this undergrowth live and move the myriad forms of animal and bird life. The shrubbery furnishes food for the deer and the moose. The smaller growth sustains the rabbits, mice and other mammals, which in their turn are food for the fox, the bobcat, the great horned owl and the eagle.

And these wild creatures not only derive their livelihood from the forest but play as well an important part in its care and maintenance. The small birds, the warblers, vireos, and chickadees—with their incessant activities are ridding the trees of worms and caterpillars and other destructive insects. The nuthatches and the creepers are climbing up and down the trunks picking eggs and larva from the crevices of the bark. The hard working woodpeckers are busily hunting out and destroying borers that live under the bark where man cannot find them, while the great pileated wood-pecker, with infinite pains, hews an opening into the very heart of the trunk and reaches the colonies of ants that have honeycombed it with their galleries.

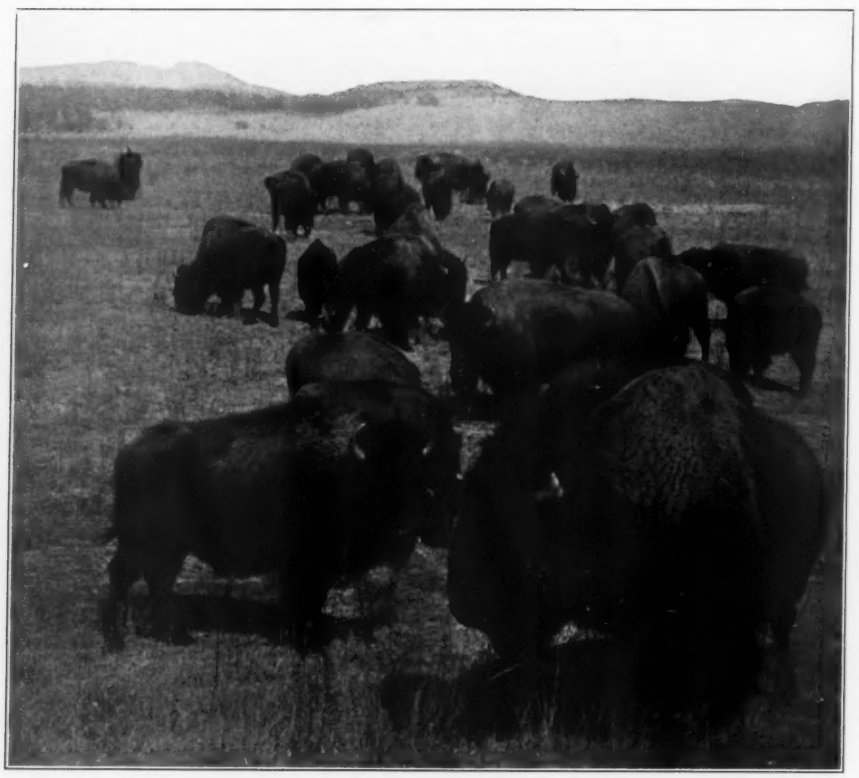
By far the greater part of these birds make their homes in the undergrowth and when man clears this out should he wonder why his trees are overrun with insect pests?

Tree surgery is well enough, in its place, but if all the dead trees and branches were removed from a forest where would the woodpeckers and chickadees and wrens find holes for their nests. And remember—many of the little creatures reared in those holes migrate later throughout the length of our country and perform an inestimable service for the farmer.

But these birds and animals not only protect their forest home, they help to perpetuate it. The red squirrel and the much persecuted grey squirrel are excellent tree planters when they bury a nut and forget where they put it. The seed and berry eating birds scatter undigested seed which takes root and makes new cover—who has not noticed the rows of Red Cedar along the old fence lines, all planted by the birds.

And so we might go on at length showing how the woods people work and live and do their part in producing that marvelous organic mechanism, nature's greatest work—a natural living forest.

Compare this, for instance, with such a carefully groomed and combed scientific product as a German forest. There we have tree orchards, tree farms, carefully selected and planted, the floor clean and garnished, useful as a lumber supply, but without character and life—like a city without people—splendid perhaps as an exhibition of architecture, but lifeless. For as hordes of people throng a city so the natural forest is thronged with its workers which are as important as the tree itself, and as necessary to make it a wilderness.



BISON IN WICHITA GAME PRESERVE.
THESE BIG FELLOWS FIND GOOD FEEDING ON THIS FINE RANGE ON THE WICHITA NATIONAL FOREST, OKLAHOMA.

LARGE BULL ELK.
THIS NOBLE ANIMAL IS WELL CONTENTED WITH HIS LIFE ON THE BUFFALO RANGE ON THE WICHITA NATIONAL FOREST, OKLAHOMA.

ARE WE IDEALISTS?

We have been accused of being idealists, dreamers. May we ask who awakened the American people to the necessity of conservation? Was it a lumberman? Was it a man versed in the principles of scientific forestry? Was it a college professor? No, it was a naturalist, an idealist, a big game hunter. To our Roosevelts, our John Muirs and our Joaquin Millers, and many others, as enthusuastic but less prominent, we must give due credit for awakening us to the peril of the total loss of our national domain to private greed and sowing for us, as a national heritage for all time, our national parks and forests.

We Americans are apt to look at things through the dollar sign but in this let us become a little sentimental and realize that the development of character, of self reliance by the love of the real wilderness in our coming generations is as important as money making.

Here may I suggest that perhaps our American Forestry Association—and I speak as a member of it—might well advocate the extension of our system of national and state parks, and their maintenance as natural wild forests, as happy recreation grounds, where the ax might never be applied except where the welfare of the forest required it in the making of fire lines and the necessary roads and trails. We have a number of such parks but we need more—not to interfere with our commercial forests, but to be a thing apart from them.

In this connection may I mention the proposed Grand Canyon National Park which the Camp Fire Club is advocating. The most beautiful section of the canyon is now a national monument,

Photo. by Dr. J. J. Kirkleride.

MOOSE HUNTERS CAMP.

THIS IS ON ELLIS BROOK, MAINE, AND IN A COUNTRY FAMOUS AS MOOSE HUNTING GROUND.

made so by a proclamation of Ex-President Roosevelt. To assure the protection of this great National wonder it should be made into a National Park, both the Canyon and a wide strip of forests on either side. May we have the cooperation of the American Forestry Association in this great and necessary work?

And now to conclude, we believe in so-called scientific forestry and in commercial forests. We must have great areas of them.

But we want also National and State parks where the forests can remain untouched, except for fire protection, where we can preserve for all time bits of wilderness, where the game and forests may exist under natural conditions. Here we and those that will come after us may get an idea of what our continent was like before it was civilized, and here perhaps we may help to develop in the coming generations some of those sturdy qualities our forefathers had.

* From an address at the 34th Annual Meeting of the American Forestry Association, New York City, January 11, 1915.

IMPROVING WHITE MOUNTAIN FORESTS

By Wm. L. Hall, *Assistant Forester U. S. Forest Service*

[The first sale of Government timber on the White Mountain forests has been made and the reason for it is of decided interest to the many millions living in New England and along the Appalachians. Twenty-five per cent. of the money derived from this sale is returned to the towns and counties in which the timber is located in lieu of taxes. The writer explains the situation clearly and his article should attract much attention.—Editor.]

THE Federal Government having acquired large tracts of forest lands in the White Mountains is now beginning the necessary improvements to make the forest fully useful to the Nation. Construction of roads, trails and telephone lines necessary to make the tracts accessible for purposes of protection and use have been under way during the past two years. Uses of the lands for purpose of summer cottages, camps and other purposes in line with the objects of the Government have begun.

As a further step in the policy of development the first sale of 500,000 feet of Government timber has just been awarded. Very naturally the question may arise as to why it is desirable to cut any of the Government's timber. Why not leave it just as it is? The answer may best be given by stating the purposes of the sale. This I will do and then discuss some of the fundamental considerations which are involved.

Briefly the purposes of this sale are to clear away a large amount of mature, overmature and defective timber and liberate a fine stand of young trees which is already present, to test methods of removing this material with minimal damage to the young growth, to ascertain the best means of disposing of the resulting brush, and to get revenue. The first object is the improvement of the stand, the second to ascertain by experiment the best methods to employ and the third to secure financial returns.

First let me discuss the third, and as some will think the least important object, the securing of financial returns. It is important that the lands the Government buys yield a return on the investment. It is absolutely necessary in the long run that they do so. The Nation will not regard the project as a success unless they do. The ones chiefly interested in having some returns from these lands, however, are the towns and counties in which they are situated. When these lands were acquired by the United States they were removed from taxation and the tax burden on the other lands was correspondingly increased. Congress has met this situation by providing that 25 per cent. of the gross returns from the sale of the timber and from other sources be returned to the States and counties concerned in lieu of taxes. It would be unfair to the towns and counties to hold back on the cutting of extensive bodies of timber and deprive them of the revenues they need.

But to come back to the main object, which is the improvement of the forest. Much of the cutting done in the White Mountains in the past left the forest in bad condition. The poor trees should have been taken and some of the good ones left. But the other thing was done. Good ones were taken and poor ones left. A great tangle of brush was left, too, which has been increased by the blowing down of some of the defective trees left standing. In its purchases the United States has acquired a great deal of this class of culled and cutover timber land. Now the problem is how to get that forest back into good condition. This sale is the first step taken in that direction and it has been made on a representative area and in a situation where the work can be handled advantageously. It

IN THE WHITE MOUNTAINS.
THIS IS IN COOS COUNTY, NEW HAMPSHIRE, AND THERE IS A FINE GROWTH OF HARDWOOD AND SPRUCE NEAR THE TOP OF THE RANGE.

covers 162 acres and occupies a strip 1½ miles long and ¼ mile wide adjacent to the west side of the Tunnel Road which passes through the notch west of Mt. Moosilauke. At the nearest point the area is 1½ miles from the railroad station of Glencliff and the average haul will be 2¼ miles over a good down grade road. The nearness to a shipping point and the presence of roads will make it possible to utilize most of the sound material which the trees contain, including some of the fuel wood.

The different parts of the area will receive somewhat different treatment due to the varying conditions. Some 31 acres are characterized by a second growth forest. On this part the former stand must have been clean cut, some portions as much as 60 other portions not over 35 or 40 years ago. In the younger present growth which is of excellent quality, paper birch, yellow birch, maple and popple make up the bulk of the stand. But few trees have reached the size for removal. In as much as the stand is not crowded, only a tree here and there will be taken out with a result which will scarcely be noticeable.

In the older second growth stand there is a larger proportion of paper birches, many of which are mature and are of optimum size, form and condition. Beneath is a fine understory of 10 to 12 foot high spruce and balsam which needs only the sunlight to spring into rapid growth. Here it is expected to remove the paper birch and popple above 8 inches in diameter and the yellow birch and maple above 10 inches, measurements being made 4½ feet above the ground. There will be removed about 2400 feet of timber per acre while the young trees to be left

Photograph by E. D. Fletcher.

HARDWOODS AND LARGE SPRUCE TO BE CUT.

IN THE CLUMPS OF SPRUCE THE FOREST OFFICER IN CHARGE MAY REMOVE THE ENTIRE GROUP PROVIDED THIS DOES NOT LEAVE A HOLE OF MORE THAN A QUARTER ACRE IN EXTENT, HE MAY THIN THE GROUP BY TAKING OUT THE LARGER TREES OR HE MAY LEAVE THE GROUP INTACT. IN THIS PARTICULAR GROUP THE HARDWOODS AND THE LARGER SPRUCE WOULD BE TAKEN, LEAVING A GOOD NUMBER OF YOUNG SPRUCE.

Photograph by E. D. Fletcher.

YOUNG GROWTH PREDOMINATES.

A FINE STAND OF YOUNG GROWTH COVERS ALMOST THE ENTIRE CUTTING AREA. OF THE TREES WHICH WILL BE LEFT ON EACH ACRE AFTER CUTTING SOME 40 TO 80 WILL BE OVER 6 INCHES IN DIAMETER, 500 TO 750 WILL BE BETWEEN 5 FEET HIGH AND 6 INCHES IN DIAMETER, WHILE THE NUMBER UNDER 5 FEET HIGH WILL BE 5,000 OR MORE.

Photograph by E. D. Fletcher

WILL ENCOURAGE SPRUCE AND BALSAM.

IN THE OLDER SECOND GROWTH STAND THERE IS A LARGE PROPORTION OF PAPER BIRCHES MANY OF WHICH ARE OF OPTIMUM SIZE, FORM AND CONDITION. BENEATH IS A FINE UNDERSTORY OF SPRUCE AND BALSAM WHICH NEEDS ONLY THE SUNLIGHT TO SPRING INTO RAPID GROWTH. THE PAPER BIRCHES ABOVE EIGHT INCHES AND THE YELLOW BIRCHES AND MAPLES ABOVE TEN INCHES IN DIAMETER WILL BE REMOVED.

Photograph by E. D. Fletcher

HOW THE THINNING WILL BE DONE.

AS THE PRESENT CULLED AREA LOOKS FROM THE STATE HIGHWAY. THE CUTTING HERE WILL BE LIGHT AND HAVE AS ONE OF ITS CHIEF OBJECTS THE IMPROVED APPEARANCE OF THE STAND. AT THIS PARTICULAR SPOT THE LARGE MAPLE AT THE RIGHT AND THE LEANING TREE WILL BE CUT AND SOME THINNING DONE IN THE GROUP AT THE LEFT. ALL THE REST WILL BE LEFT. ALL THE BRUSH ALONG THE HIGHWAY WILL BE BURNED.

will number 5157 per acre of which 80 will be over 6 inches in diameter.

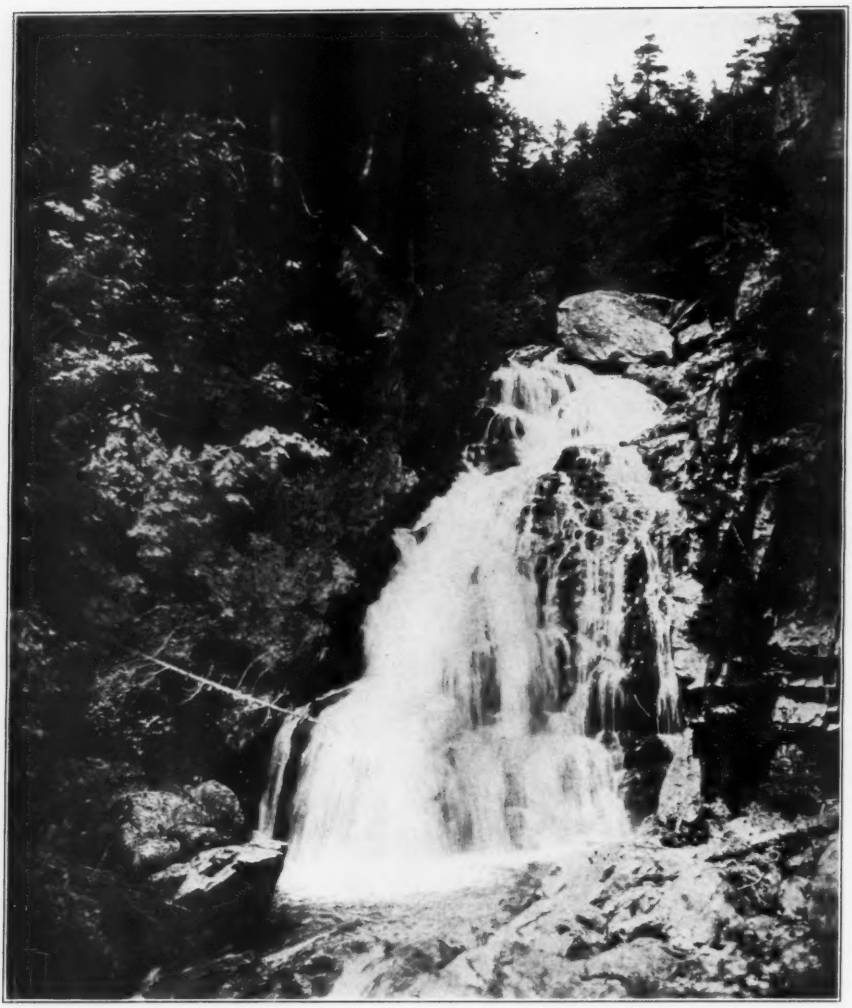
The principal part of the sale area, 118 acres, is occupied by a mixed forest of hardwoods and spruce from which the better trees were culled some 15 years ago. There remain numerous defective and old hardwoods with here and there clumps of spruce and balsam, the trees in which have made considerable growth since the last cutting. This type presents a very unattractive appearance. One sees at first glance some very good looking large maples and birches but a casual examination shows some to be defective and others to be overmature and on the decline. The previous cutting left several big holes in the forest where all the trees were removed. In other places small clumps and single trees which were left have blown down making an almost impenetrable tangle. It will be an easy matter to put this kind of forest into much better condition for growth but it will be difficult to make it look well. But let it be remembered that it does not look well now.

It is proposed to remove the yellow birches and maples above 10 inches in diameter and the paper birches and other species above 8 inches. Spruce will not be cut under 12 inches except as a tree may be subject to windfall if left standing. Trees larger than the cutting limits will be left where they are needed to fill up the stand. The forest officers in charge of the sale will have a good deal of latitude in deciding whether to take or leave an individual tree. The effect in this type will be to remove about 4000 feet of timber per acre with a considerable thinning of the stand but care will be exercised to make no large gaps. If after the operation there appear to be considerable areas which have been clean cut they will be those which resulted from the former and not from the present cutting. There will be left on the ground some 6900 young trees per acre of which 38 will be over 6 inches in diameter, while 750 will be between 5 feet in height and 6 inches in diameter.

Fartherest from the road and highest on the mountain is a small section of virgin mixed forest which at the very highest point changes to a pure stand of small sized spruce. This latter will not be cut at all. From the mixed portion the large trees of both spruce and hardwoods will be removed leaving the ground well covered with a vigorous stand of young spruce, paper birch, yellow birch and maple.

No timber will of course be cut until it is marked by the forest officer in charge of the sale and the following instructions have been issued to guide him in marking the mixed hardwood and spruce type:

"In those portions of the type in which there is considerable merchantable spruce a selection system, by which all the overmature, mature, and deteriorating timber of all species will be removed, should be followed. Windfall must be particularly guarded against, especially in the spruce. For this reason the diameter limits specified should not be adhered to except as they may serve as an indication of the maturity of the timber. Thrifty trees which may be expected to further develop within the next 30 years and form a part of the succeeding cutting should be left. Spruce frequently occurs in the form of a group. In marking spruce, therefore, it will be advisable to form a group wherever practicable of at least one-fourth of an acre in extent and (1) leave the group intact; (2) thin out the larger hardwoods and spruce over 12 inches, leaving the remainder of the group, where the thinning can be done without danger from windfall; or (3) clear cut the group. The method to be followed must depend upon the composition of the group, the site, the condition of the timber, and the degree to which any cutting within the group can be conducted without making serious openings and endangering the remaining trees from windfall. The point to be borne in mind is that it is desired to have all mature or deteriorated spruce and hardwoods removed, and where they can not be removed from a spruce group without endangering the remaining trees in the group from windfall, the marker has the alternative of leaving the entire group or clear cutting."



CRYSTAL CASCADE IN TUCKERMAN'S RAVINE.
THIS IS ON THE SLOPE OF MT. WASHINGTON IN COOS COUNTY, NEW HAMPSHIRE. NOTE THE DENSE FOREST GROWTH ON EACH SIDE OF THE FALLS.

It must be recognized that no matter what the purpose of cutting in the forest there must result an accumulation of brush. We cannot avoid brush in cutting timber any more than we can avoid dust in sweeping the floor. One of the most important questions in this as well as in all sales on Government lands in the White Mountains will be how to handle this brush so as least to damage the forest and offend the eye. The softwood brush will not make much trouble. The stand is only about one-half softwoods, the tops are small and the trees are either scattered or in small groups. Furthermore, the soft-wood trees are to be used down to 4 inches in diameter at the top so that the amount of brush will not be great. The regulations provide that the soft-wood brush shall be piled and burned.

GLEN ELLIS CASCADE, WHITE MOUNTAINS.
ONE OF THE NUMEROUS WATER FALLS WHICH WILL BE PRESERVED BY THE PRESERVATION OF THE FORESTS UNDER THE CONTROL OF THE GOVERNMENT.

It is the hardwood brush that gives most concern. The big maples and birches have huge tops and in the first place they will cause some damage in felling. This, however, can be kept at a minimum by careful supervision of the cutting operations. The big hardwoods can not be used down to as

small a diameter in the tops as the spruces and firs. Generally it will not be possible to use them below 8 inches and often the top is dissipated into limbs at a point where the trunk is 12 or 15 inches in diameter. Such trees invariably result in a large quantity of brush. The regulations require that all of the limbs be cut from the trunk and that the brush three inches in diameter and smaller be piled or scattered at the discretion of the Forest Officer in charge. It is the purpose of the Forest Service to ascertain by careful study the best means of handling this kind of brush. There is to be a great deal of it in the White Mountain sales and we want to learn as soon as possible how to deal with it.

The branches larger than three inches in diameter are to be trimmed up and left flat on the ground unless they can be utilized as cordwood. The contract has been drawn on the supposition that much of this material can be utilized as fuel. If so it will be easier to clean up the sale area and leave it in neat and tidy condition.

SPECIAL TREATMENT FOR STRIP ADJACENT TO HIGHWAY

It is proposed to give special treatment to an 8-rod strip bordering the State Highway. On this strip the utmost care will be taken to do the cutting and to handle the material to be removed and the brush in such a way as to give no offense to the critical observer. Before the sale was awarded a special marking Board, consisting of three experienced men of the Forest Service, went over and marked the trees to be removed on most of the strip. The purpose was to determine in advance the trees to be removed, and to provide a sample marking for the purchaser and for the forest officer who will have charge of the sale. The result of this special study and marking is to leave slightly more good young merchantable timber on the ground here than on other portions of the area. If a thrifty birch 12 or 15 inches in diameter is needed as a cover or to fill a gap it has been left. The ground was gone over tree by tree and nothing was marked for removal unless it was defective or could be removed without damage to the appearance of the area.

Also on this 8-rod strip pains will be taken to dispose of the brush. As elsewhere the softwood brush will be piled and burned and the hardwood brush will be handled in the same way unless the cost is found to be prohibitive. Another thing which will be done to improve the appearance of this border strip is to cut down the decayed snags and dead trees, of which unsightly specters the strip contains more than a hundred. These will be brought to the ground, and while it may not be possible to remove them, lying flat upon the ground it will not take them long to decay.

RESULTS

We confess to a feeling of considerable responsibility in undertaking to cut any timber in the White Mountains where the public interest in forest protection is so keenly active. The knowledge that this keen interest exists makes us all the more anxious to try to put the forest in the best possible growing condition. In many places the condition is bad now and there is no doubt but that it can be greatly improved. The question is whether we can do the work successfully by meeting the three essential requirements:

(1) Give the forest the grooming it needs for future thrift and production.

(2) Accomplish the work without alarming a watchful public which has come to abhor the old destructive method of timber removal.

(3) Secure returns which will cover the cost of the timber to the Government and the cost of making the sale.

This is the first sale and we may not succeed as well with it as with later ones but because it is the first sale and because we believe the purpose is right, we bespeak the sympathetic interest of the public. Let us try to restore to these mountain slopes a forest that is as good and if possible better than the virgin stand.

FORESTRY EXHIBITION BUILDING.
IN THE NEW MEXICO BUILDING AT THE PANAMA-CALIFORNIA EXPOSITION AT SAN DIEGO, CAL., IS THE UNITED STATES FORESTRY SERVICE EXHIBIT IN CHARGE OF DON CARLOS ELLIS.

FORESTRY AT THE EXPOSITIONS

By ALLEN HENRY WRIGHT

IT IS in the New Mexico building at the Panama-California Exposition in San Diego, California, that the United States Forest Service is making its official exhibit, with Don Carlos Ellis in charge. On the second floor of this structure, which is a reproduction of one of the oldest buildings in the State of New Mexico, the mission of Acoma, Mr. Ellis has arranged the model fire-fighting station, with all its equipment, the charts showing the work of the Forest Service, maps upon which are shown the National Forests, and models of some of the forests, particularly of New Mexico. Then, too, there are specimens of the various kinds of commercial woods which are grown in the National Forests, and specimens of the grasses that are good for range cattle and those which are bad.

This exhibit has attracted much interest since the Exposition opened on New Year's Day, and much credit has been given Mr. Ellis for the manner in which he has arranged it. From San Diego he will proceed to San Francisco, where he is to install a similar exhibit for the government at the Panama-Pacific Exposition. During the year he will divide his time between the two cities and their big fairs.

Aside from the forestry display made by the United States government, the San Diego exposition has much of interest to the student of forestry and the reclamation of barren wastes, for the very site of the exposition was little more than a waste spot only two years ago while it is now a garden of floral beauty, with thousands of fine trees, like the acacia, pepper, eucalyptus and palm, lending themselves to the charm of the whole.

A Full View of the Benedict Elm.

LARGEST ELM IN CONNECTICUT

By Norman de W. Betts

LOCAL tradition has it that the Benedict Elm in the township of Wilton, Fairfield County, is now the largest elm in the State of Connecticut. The circumference measured on January 1, 1915, at about four and a half feet from the ground was 14 feet, 11¾ inches. The spread was paced in the direction of the highway which it borders and was estimated to be 105 feet. The trunk, as is shown in the photographs, soon breaks up into a great number of large branches which in turn form a very symmetrical and imposing crown.

In a State noted for its elms, it would be of interest to know how large these veteran shade trees have grown. It might be wise to put on record the descriptions of some of the grandest among them before insects and fungi have brought them down. Perhaps there are other Connecticut elms that have local traditions; where is the largest specimen of this splendid tree?

THE BENEDICT ELM.

THIS ELM IS IN WILTON TOWNSHIP, FAIRFIELD COUNTY, CONN. THE CIRCUMFERENCE IS FOURTEEN FEET, ELEVEN AND THREE QUARTER INCHES; AND THE SPREAD ABOUT 105 FEET. IT WAS MEASURED AND PHOTOGRAPHED BY NORMAN DEW. BETTS, JANUARY 1, 1915.

CANADIAN LUMBER COMPETITION

By H. D. Langille

TWENTY-FIVE hundred miles of peaceful, unfortified boundary separates two countries hardly less similar in racial qualities than two contiguous States of the Union. In physical characteristics the two draw apart—the one reaching northward into the Great Barrens; the other southward into tropical luxuriance. The one yields only sustenance for sturdy types; the other is adaptable to every race and productive of almost every product required by humanity. The United States may be self-sufficient; Canada cannot be so. Its greatest development has taken place at its southern extremities, almost within its southernmost two degrees of latitude. Its population in 1911 was only 1.9 souls per square mile. The Silent Places are vacant.

The forest geography of the two countries is not dissimilar. Eastward from Manitoba there was once a vast forest of white and Norway pine corresponding to that of Minnesota and Michigan; while in the southern peninsula of Ontario was an almost solid forest of hardwoods. Quebec was the home of spruce. The Maritime Provinces were densely forested with pine, spruce, hackmatack, balsam, hemlock and various hardwoods. The Height of Land defines the northern boundary of the pine forest. Northward stretches a great scope of spruce woods reaching to Hudson's Bay and thence northwestward almost to the Arctic Sea in latitude nearly seventy degrees.

The earliest records of lumber manufacturing in the provinces runs back to 1696 when planks for gun platforms were cut in New Brunswick. In 1761 it was reported that thirty-one saw mills were in operation in Nova Scotia. Continually since that time the Dominion has given of its forests to the world and despite restrictive tariff measures enacted by the United States there has been an almost constant increase in the volume of lumber exported across the border. As early as 1813 the value of wood exports was $29,397,534. In 1897, the fiscal year preceding the adoption of the Dingley bill, the exportation of sawed lumber to the United States was 883,770,000 feet In 1898, "the year following the restoration of the old duty of $2.00 on lumber, the imports of boards, deals, etc., dropped to 353,134,000 feet."[1] The total lumber production of Canada in 1912 was 4,389,723 M. In the United States it was 39,158,414 M. The average annual cut per mill in Canada was 1800 M against 1300 M in the States.

The white pine cut of Canada reached its maximum in 1908 and the depletion of its hardwood supply has been rapid. The volume of hardwoods imported during 1910 exceeded by 50 per cent. the value of the hardwoods manufactured into lumber in Canada during that year. As in the United States the scene of greatest production by a single state or province has shifted to the western coast.

The forests of the eastern and northern United States, like those of Eastern Canada, are fast disappearing. With their disappearance has passed the most romantic period in the history of the lumber woods. The chanties are forgotten.

Alike in forest physiography, the forest development of the two countries has followed parallel lines. The spread of prairies on both sides of the international boundary has been spanned. The scenes of greatest activity have been transferred to the western side of the continent where another expanse of forest invites the energies of the men of the woods. Under new physical and economical conditions the contest has been renewed. The last act in the tragedy of America's coniferous forests is staged in British Columbia and the

[1] "History of the Lumber Industry."

INTERIOR OF BRITISH COLUMBIA.
THIS SCENE IS TYPICAL. THERE ARE DENSE FORESTS OF SMALL ENGLEMANN SPRUCE, CEDAR, HEMLOCK, DOUGLAS FIR AND SUB-ALPINE FIR AND IN THE DISTANCE ARE HILLS WHICH HAVE BEEN SWEPT BY FOREST FIRES.

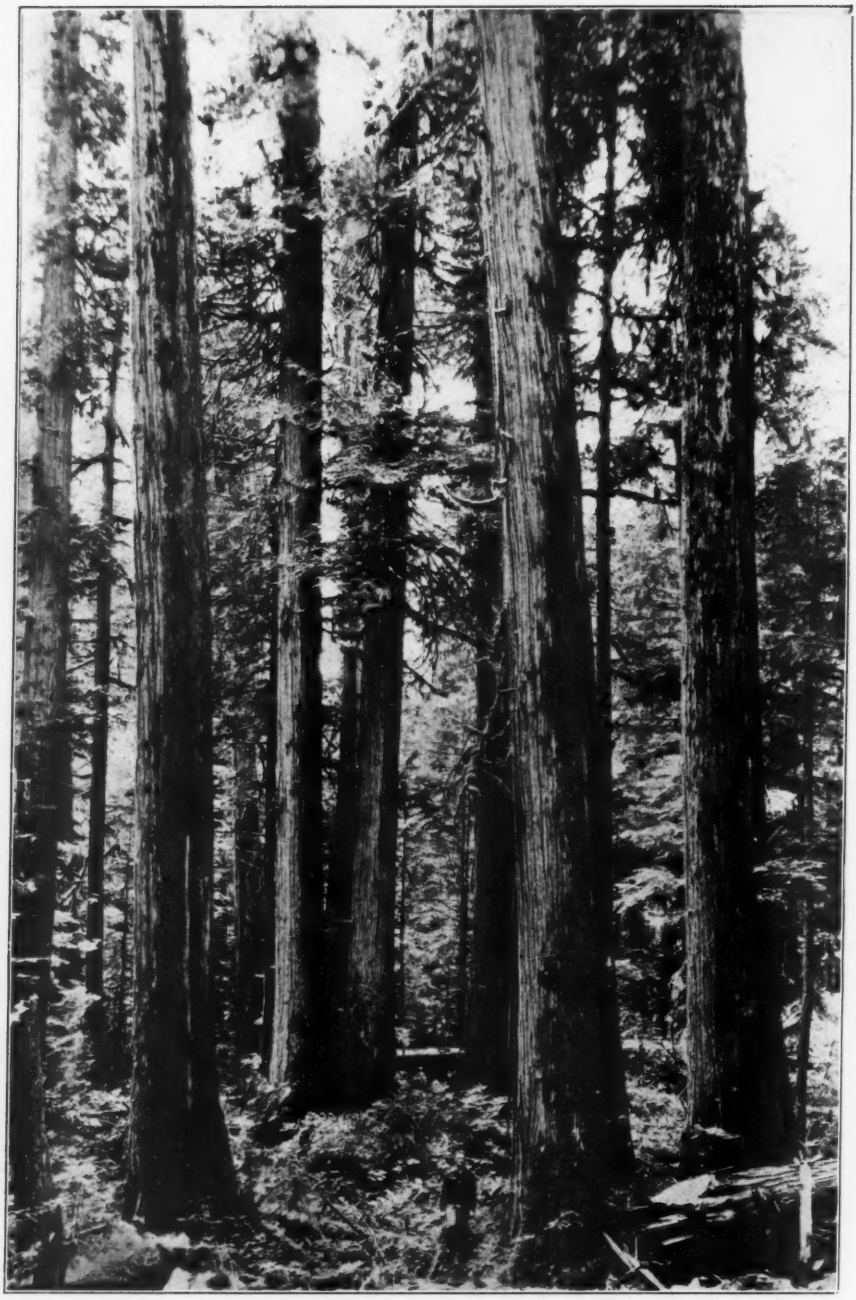
coastal States of Washington and Oregon.

Like the forest of the Atlantic side that along the Pacific and on either side of the boundary is comprised of the same species. The chief difference is in the percentages of species and the conditions under which they grow.

West of the great prairies, in the inter-mountain region, the boundary marks approximately the dividing line between two important forest zones, namely, that of western and white pine in the States and an inferior forest of cedar, spruce and hemlock in the Province; although there is some pine north of the boundary and much of the other type south of it. In that region the forest is light in comparison with the coastal forest, the trees are small and the lumber they yield is mostly of low grade; although well adapted to the needs of the adjoining prairie districts.

The optimum region of Douglas fir is between 44 and 48 degrees of north latitude, west of the Cascade Mountains. Interlocking with it on the north is British Columbia's wonderful stand of Pacific red cedar, comprising a very important part of the forest northward to latitude 51 degrees. Northward from that zone, hemlock and silver fir are the prevailing species. Alpine forms descend to sea-level.

The area of the forests of the Province has been variously estimated to be from 182,000,000 acres to less than 17,000,000 acres. The best information available indicates that there may be about 17,000,000 acres of merchantable saw timber. In the opinion of the author, based upon actual cruisings and examinations of 1,328,000 acres of this area, there is 335 billion feet in the Province, in place of 240 billion feet as conjectured by the Royal Commission



BRITISH COLUMBIA CEDAR FOREST.

A TYPE OF THE CEDAR FROM WHICH THE FAMOUS BEVELED SIDING AND SHINGLES ARE TAKEN. NOTE THE FIGURE OF A MAN AT THE FOOT OF A TREE.

of Inquiry in its report made in 1910. The area is less than was formerly supposed but the stand is heavier. The total timber supply of the Province approximates that of Washington.

But British Columbia's forest is inferior as to quality and species as the value of species is differentiated at this time. The following table of comparisons, based upon Lacey & Company's cruisings in both territories, outside of national forests, parks and reservations, shows the difference existing in the respective regions west of the Cascade Mountains:

COMPARISON BY SPECIES

	Oregon.[2]	British Columbia.
Douglas Fir.....	82.3 per cent.	21.3 per cent.
Cedar.....	2.4 per cent.	34.4 per cent.
Western Hemlock	9.1 per cent.	28.5 per cent.
Spruce.....	2.1 per cent.	4.3 per cent.
Silver Fir (A. Amabilis).....	1.5 per cent.	11.0 per cent.
Miscellaneous...	2.6 per cent.	0.5 per cent.
Average stand per acre.....	41.6 M feet.	22.2 M feet.

The best timber is most available. Present-day cutting is going on in the most accessible and superior forest. The topography of the coastal region is extremely mountainous and the mountains are generally steep, with bald, rocky crests and narrow valleys between. The commercial forest is on the lower levels. In the interior, glacial formation characterizes the country. The valleys are wider and the slopes are usually less abrupt where merchantable timber grows. The mountain chains are mostly bare and snow-covered during the greater part of the year.

TENURE

Nearly one-half of British Columbia's forest is held under Special Timber Licenses; the remainder under various kinds of grants and leases, and reservations. With the exception of certain Crown grants it is all subject to the payment of royalties when cut. The Forest Act of March 4, 1914, embodies wise forest legislation, virtually making the holders of licenses and other tenures partners with the government. It provides for a royalty of 85 cents per M upon all No. 1 or No. 2 Douglas fir, spruce, cedar, pine or cottonwood cut west of the Cascades after January 1, 1915, and 50 cents upon all other timber suitable for lumber and shingles. East of the mountains the royalty shall be 50 or 65 cents, according to locality. After January 1, 1920, the royalty shall be increased at the end of five-year periods by amounts equivalent to different percentages "of the increase (if any) in the average wholesale selling price of lumber f.o.b. mill, over $18" per M. The license fee is fixed during the period to December 31, 1954, at $140 per license of not more than 640 acres west of the Cascade Range and $100 east of the Cascades. This rental is approximately equivalent to the average tax per M feet on fee lands in the States. It is fixed and not subject to the caprices of tax levying bodies.

STUMPAGE AND LOG VALUES

In normal times log values are the same in the province as across the line; and as a general statement it may be said that the difference between log cost and log value, which is stumpage, including royalties, is about the same for logs of equal quality. In each territory original purchasers acquired timber at prices which are almost negligible in the cost of logs but latter-day buyers in British Columbia have been required to pay as much for timber of equal log value as is paid in the States. There is but little, if any, foundation of fact in the statement often made by operators in the States that our neighboring manufacturers can sell for less because their timber is cheap. Timber that the market of these years will absorb is not comparatively cheap in the log.

MANUFACTURING COSTS AND LABOR

The initial cost of logging equipment and maintenance is higher in British Columbia than in Washington or Oregon owing to heavy import duties. Supplies and woods labor are higher and the labor, as a rule, is less efficient. The provincial laws prohibit employment of Oriental labor in provincial forests

[2] Similar figures for Washington have not been compiled but the percentage of cedar is greater.

or on public works, and the standard government wage fixes a high rate for all labor. Eighty per cent. of the donkey engines and blocks, etc., is made in the United States. The wire rope comes from England, while saws and small-mill machinery is mostly made in Canada. Large mills use American-made burners, bands, gangs, log-deck and electrical machinery. The proportion of American-made goods is decreasing but Canadian prices are based on American prices, plus duty. A comparison as between wage scales of mill and woods workers shows that wages in British Columbia are about 10 per cent higher than in Oregon. Considerable Oriental labor is used in the yards but its cost, per unit of production, is equal to that of the labor employed n the western States.

The climatic conditions are similar except that the heavy rains of the northern coast cause more loss of time in the camps. Cutting is less advanced amid the intricate system of interior waterways in the province, hence the haul to water is shorter. The conditions are similar to those which prevailed along Puget Sound and Columbia river in the days of small loggers. The waterways may offset in a measure the disadvantages alluded to but small operations cannot be economical and the day of the hand logger has passed. It is generally claimed by provincial loggers and manufacturers that operations in the Province cost 20 per cent. more than in the States; and this is unquestionably true in the inter-mountain districts, at least. It is the log value at points of manufacture that counts in a discussion of competition and this has been shown to be equal; excepting that in the States log prices of water-borne logs are made as at booms while in the Province they are usually for logs delivered at points of manufacture.

With its wealth of good cedar British Columbia is able to produce enormous quantities of shingles. Unopposed by restrictive duties it may easily capture the shingle business of the United States where the supply of cedar is comparatively limited. The Province also bears an immense amount of pulp timber and water power for its

AMONG INLETS AND INSIDE WATERS IN BRITISH COLUMBIA.
THIS SCENE IS CHARACTERISTIC. NOTE THE NARROW SHORE LANDS, WELL FORESTED, RISING TO HIGH PEAKS EITHER BARREN OR BEARING POOR TIMBER.

development. One paper mill is now producing 225 tons daily. A sulphite fiber plant is producing 40 tons of fiber per day. "A small portion of this suffices to supply the Provincial market, while freight rates prevent the shipment of newsprint to points east of Alberta. A small quantity of newsprint is shipped to be distributed from Calgary and Edmonton, the balance (comprising over 75 per cent of the output) being marketed in the Northwestern States. About 25 per cent of the sulphite fiber is sold to paper mills in the same market."[3] This in the face of the fact that pulp logs in those States cannot be sold for enough to return the cost of logging. The first shipment of wood pulp from British Columbia to the Atlantic coast was consigned to New York in September of this year.

CANADIAN MARKETS

In 1911 the population of Canada was 7,207,000. The five western provinces with an area of 1,723,700 square miles had 1,321,748 people or less than the present estimated population of Philadelphia. But during recent years there has been an unparalleled influx of settlers into that territory seeking homes on the boundless prairies within the range of grain production. A great boom was experienced. Railroads were built and towns followed. The vacant places were sparingly peopled. As a result an enormous demand for lumber was created—greater per capita than was ever before known. To the west was the almost untouched forest reaching to the sea and the government invited its exploitation. Millions of dollars were invested in timber and manufacturing equipment. Plants sufficient to supply the normal demands of ten million people were erected in frenzied haste to supply one and one-half millions.

Then, by 1913, immigration practically ceased. Stagnation followed inflation and in rapid succession the mills went down, leaving capital and labor unemployed. In 1910 there were 225 saw mills in British Columbia with a

[3] Report of the Minister of Lands, 1913.

A Perfect Douglas Fir.

THIS IS ON VANCOUVER ISLAND, BRITISH COLUMBIA. SUCH SPECIMENS ARE LESS COMMON IN THE PROVINCES THAN IN THE STATES.

WESTERN HEMLOCK IN BRITISH COLUMBIA.

THIS SPECIES IS COMPARABLE TO EASTERN HEMLOCK ONLY IN NAME. THE AUTHOR CLASSES THIS AS A GOOD STAND.

daily capacity of 4½ million feet. In 1912 it was estimated that $52,000,000 of American capital was invested in mills and timber in the Province. There are now about 365 saw mills and 61 shingle mills in British Columbia and in 1913 they cut 1,515,828 M feet of lumber and about 480,000,000 shingles, raising the Province to first place in the Dominion as a lumber producer. In 1909 it produced only one-fifth of the total cut of Canada.

So great was the consumption of lumber in the prairie provinces that besides four-fifths of British Columbia's output that market absorbed 479,169,300 feet of lumber, 121,940,000 lath and 90,093,000 shingles imported from the States during 1911 and 1912. It was a dumping ground for low-grade lumber from the Inland Empire. No effort was made to develop a foreign market. When the slump came there was distress.

Eastern Canada has an important trade with foreign countries and its relations with the eastern United States are fixed. The problem of overshadowing moment is what British Columbia shall do with the products of its surplus of mills.

Through time beyond reckoning the prairie provinces will be large consumers. Settlement and wheat growing will reach northward to latitude 55 degrees and the sparsely settled districts will fill with farms, but the abnormal demand of the years just past will never develop again. Years may pass before the capacity of today will be reached. In the meantime the capital invested cannot remain unproductive. Impatient of returns from timber new mills will be built. As in the United States, government will look to its forests for revenue, encourage waste and aid in destroying the industry by selling whenever and wherever it can on terms which foster incompetence and invite affliction.

With capacity to supply ten millions of people and one and one-half millions to supply, the manufacturers are seeking to know what they shall do to survive. The answer must be found among ten millions of people outside of Canada. Lumber is a bulky product. Its best market is that nearest the source of supply; hence Canadian manufacturers turn to the one hundred millions of people across the line—the most prodigal users of lumber in the world. The tariff bars are down, international railroads have reduced their rates to equal those of all-American lines; the way to a market is open and buyers in the States may now rejoice at the spectacle of a demoralized industry struggling from both sides of the boundary to increase consumption by cutting prices to or below cost of production. The day of Canada's retribution dawned on October 3, 1913, when the Underwood tariff took effect.

During the fiscal year ending June 30, 1914, 472,245 M feet of lumber worth $11,481,431 was exported to Canada from the United States and there was received in return 892,833 M feet worth $16,936,930.[4] In the last nine months under protective tariff British Columbia sent into the United States 1,861,100 feet of lumber, while during the first nine months of free trade the shipments amounted to 12,030,799 feet,[5] an increase of 546 per cent. but withal not an alarming amount when compared with shipments into the prairie provinces from the States during 1911. During the first eight months of 1913 importations of Canadian shingles amounted to 288,047 M valued at $743,030; while during a corresponding period in 1914 the importations amounted to 765,627 M worth $1,776,930, an increase in volume of 139 per cent. Of the 765,627,000 shingles imported this year 201,842,000 were shipped from British Columbia through the Puget Sound gateway, as compared with 30,706,000 received through the same gateway during the first nine months of 1913 under a protective tariff.[6] This indicates the ascendancy of British Columbia shingles over those made in Washington and Oregon. The total value of all wood products imported into the United States from Canada in the year

[4] Bureau of Foreign and Domestic Commerce
[5] "The Timberman" November, 1914.
[6] West Coast Lumberman, November 15, 1914.

ending June 30, 1914, was slightly less than that of 1913. Only a profitless market, over-production and general impoverishment of the industry in the United States will prevent heavy importations this year. The British Columbian manufacturer cannot compete successfully with present prices.

WESTERN PINE.
A TYPICAL STAND IN SOUTHERN BRITISH COLUMBIA NEAR THE NORTHERN LIMIT OF THE SPECIES.

A notable difference is found as between the attitude of government in Canada and the United States. In Canada, and particularly British Columbia, a partnership has been established between lessees and actual owners. Parliament aids in developing industry at home and abroad. In the United States, Congress authorizes the expenditure of a million or two of dollars that a mythical, impossible trust shall be sought for. Canada is seeking preferential tariff relations with her sister countries of the empire, seeing in them parts of the ten million consumers she needs.[7] An effort will again be made to impose an import duty upon American lumber entering the Dominion. The time is opportune for trade extension at home and abroad and with the return of normal conditions in the States the wheels of industry will again turn in the Province prolonging the idleness of labor and capital from which the northwestern States are now suffering.

British Columbia will not hope in vain for an American market. The Panama Canal and our shipping laws invite participation in the trade of the Atlantic seaboard. Cheaper vessels, smaller crews and lower wages paid them combine to this end. Shippers and vessel owners aver that it costs from 20 to 25 per cent more to transport lumber to the Atlantic seaboard from American ports on the Pacific than from British Columbia ports — and America dug the canal. With rail rates the same as and water rates say $3.00 per M lower, British Columbia manufacturers have an opportunity to reach the coveted ten million people and they will grasp it.

Among the lumbermen of the west there is an urgent demand for the restoration of an import duty on lumber, at least sufficient to prevent dumping

[7] See "The Timberman," November, 1914.

in times of stress. Admittedly their business is demoralized. As in the case of British Columbia there is an excess of productive capacity which cannot adjust itself to demand because of small-unit production and the facility with which supplies of raw material may be obtained. On both sides of the line the industry is in a helpless condition. Every thousand feet of lumber unmarketable at home which can be sold on the opposite side of the line is sold at any price above the cost of the labor applied in producing it because such sales reduce the cost of the output and add to the profits of the producer by helping him meet his overhead. Under the conditions which have prevailed during the greater part of the past seven years lumber manufacturers have followed receding hope until many are seeking the only direction of motion their perspicacity reveals—the return of their investments in stumpage through the immediate agency of the saw. Lumbering is a primitive industry in which countless men having primitive ideas of business are able to engage. It is undergoing enforced readjustment because it has at last reached the period when it must yield to the demands of modern business. Neither protective tariffs nor any other legitimate forms of legislation can save it in the absence of large control of raw material, large scale production and applied modern business principles.

From the standpoint of national economy there would be danger in restoring a duty on lumber. The immediate effect would be to attract into a less profitable industry capital that would have been invested in more productive channels. As a result waste would be further increased with corresponding loss to communities and countries. Temporary depression has reduced the Canadian demand for British Columbia lumber and the United States will be made a dumping ground for the surplus of its mills at prices as close to the cost of production as may be necessary to sell their product, until such time as the surplus of productive capacity shall be forced out of business or more profitable markets can be found.[8]

British Columbia mills cannot compete with American mills *and earn a profit;* but so long as a market can be found they will avail themselves of it and be large factors in continuing the present bootless condition. It is a raw, primitive country engaged in primitive industries. Its forests comprise its chief resource. It sends to us its lumber, shingles and pulp in return for our manufactured and agricultural products. If free trade be continued each country will tend to produce only those things for which it is best adapted and rely upon the other for the things desired and in the production of which it has a relative advantage. While the United States produces an enormous volume of raw materials it is destined to be a great manufacturing nation. Our markets for manufactured goods must be found in countries like Canada. During the fiscal year ending June 30, 1913, we sent to each individual in Canada about $52 worth of exports and took from each individual about $15 worth of imports.

Unless we give we cannot receive. The problem resolves itself into the economic question of whether or not those lumbermen of the United States who are impoverished by their own inability to apply fundamental principles of efficiency should be protected at the cost of other industries until an enforced readjustment is complete. The advantages of the contest are theirs.

[8] In these paragraphs the author has borrowed liberally from "Modern Business."

E. E. Ring, President Maine Forestry Association.

Charles D. Bartlett, Vice-president Maine Forestry Association.

MAINE FORESTRY ASSOCIATION

WITH an enthusiasm which it is evident will carry it along to a large membership and a successful career, the Maine Forestry Association, which has been dormant since 1908, was reorganized and revivified at a largely attended meeting held in Bangor, Maine, on Friday, January 22nd. This was accomplished largely through the efforts of Prof. John M. Briscoe, head of the forestry department at the University of Maine at Orono, and Mr. E. E. Ring, secretary of the first organization. The meeting was attended by former members, representatives of railroads, lumber companies, pulp and paper companies; members of the State legislature, State officials and people generally interested in improving the forest laws of the State.

Considerable forestry legislation is needed at the present time, or will be in the near future, and quite the best way to secure it is to organize a strong State Forestry Association which, working in cooperation with the American Forestry Association, will be able to arouse the people of the State to an

W. A. Hennessey, Secretary-Treasurer Maine Forestry association.

appreciation of the need of better legislation, and with them to obtain the attention of the State legislators to bills which will be presented.

Charles E. Bartlett of Bangor presided at the meeting, and addresses were made by Prof. Briscoe, P. S. Ridsdale, Secretary of the American Forestry Association, State Forestry Commissioner Viles, Senator Forrest Colby, Chairman of the State Forestry Committee and by a number of others.

The officers elected are Hon. E. E. Ring, president; Charles D. Bartlett, vice president; W. A. Hennessey, secretary-treasurer; Hon. John A. Bass, Bangor; Hon. Blaine S. Viles, Augusta; Hon. Forrest Colby, Bingham; Fred A. Gilbert, Bangor; George B. Dunn, Houlton; H. P. Buck, Bangor; Prof. J. M. Briscoe, Bangor; Alfred K. Ames, Machias; and Frank P. Thomas, Rutherford, directors.

NEW YORK STATE MEETING

THE third Annual Meeting of the New York State Forestry Association, which now has a membership of over 500, was held on January 13 and 14 at the Powers Hotel, Rochester, New York.

The evening of January 13 was given over to an illustrated address by J. Horace McFarland, President of the American Civic Association, on "Efficient Trees for American Streets." After Mr. McFarland's address an informal buffet luncheon was served at which unusual spirit and enthusiasm was shown by those present.

On January 14 the regular business of the Association was taken up after which short talks were given as follows: Mr. C. R. Pettis, Superintendent of State Forests, spoke on the advisability of the Association offering prizes to Boy Scouts for fire protection, tree planting, etc. A committee was appointed with power to expend certain funds in this matter. Professor Bristow Adams of Cornell University spoke on publicity work by the Association. Hon. John B. Burnham spoke extemporaneously, recommending the use of white cedar for planting in the eastern half of the State. Professor S. W. Allen of the State College of Forestry at Syracuse took up the subject, "What a State College of Forestry can do for the Association." The principal address of the morning was given by Mr. Harris Reynolds, Secretary of the Massachusetts Forestry Association, on "The Massachusetts Forestry Association's Work and its Application to Conditions in New York."

In the afternoon Hon. Henry W. Morgan of Rochester talked very interestingly on the planting of shade and fruit trees along highways about our cities. Commissioner John D. Moore of the State Conservation Commission spoke at length on the year's work of the Commission.

The meeting was adjourned, after a few remarks by Dr. J. S. Whipple President, on the future of the Association, and the election of the following officers:

President, Dr. J. S. Whipple; Secretary, Prof. Frank F. Moon; Treasurer, Sen. H. S. Holden; Vice-Presidents, Hon. John D. Burnham, Mr. Frank L. Moore, Hon. Franklin D. Roosevelt, Dr. A. S. Downing, Mrs. E. G. Whitmeyer, Dr. C. M. Dow, Sen. J. B. Mullin, Hon. John R. Clancy, Mr. John G. Agar, Mr. M. H. Hoover, Mr. E. L. Perry. Mr. Eugene S. Bruce, Mr. Thos. McCabe, Mr. K. W. Goldthwaite, Dr. Geo. G. Atwood, Mr. James Annin, Mr. John D. Moore, Mr. Frank A. Cutting, Mr. Jacob Hasslacher, Mr. F. Ambrose Clark.

Executive Committee: For three years, Dr. E. H. Hall and R. S. Hosmer; for two years, C. R. Pettis, Dr. Hugh P. Baker; for one year, Mr. Geo. N. Ostrander and O. H. Van Norden. Auditors: For two years, Mr. S. N. Spring; for one year, Mr. W. G. Goward. Trustees Permanent Fund: For three years, Mr. Chas. M. Dow; for two years, Mr. Frank E. Kendall; for one year, Walter C. Witherbee.

NORTH CAROLINA MEETING

LUMBERMEN, club women, foresters, railroad men, legislators, and public officials met together at the fifth annual convention of the North Carolina Forestry Association in Raleigh, January 13, and joined in urging upon the General Assembly the necessity of taking some definite and immediate action to preserve the forests of the State from the present frequent and destructive fires. Nearly every speaker touched in no uncertain terms upon this subject and strong resolutions were endorsed calling upon the State Legislature to make possible a State fire protective system and to create a State park on Mt. Mitchell. Resolutions were also passed asking Congress to continue the appropriations for cooperative fire protection under the Weeks law; urging the public school authorities to include at least some study of forestry in their curriculum and make the observance of Arbor Day general; approving the organization of local forestry clubs for the purpose of fire prevention; and urging the extension of the Stock law all over the State.

Governor Locke Craig's address dealt largely with the proposition that the State purchase an area on the top of Mt. Mitchell for the purpose of preserving part of the virgin forest and including the summit of the mountain.

The President of the Association, Mr. Hugh MacRae of Wilmington, in his annual address enforced the two principles of conservation and efficiency. "I look to an enlightened public opinion to bring about the protection of the forests. If people realized that the small trees belonged to the children they would feel differently. . . . No group can progress without lifting up the community. Education along these lines is essential."

Dr. Joseph Hyde Pratt, State Geologist, emphasized the need for forest protection in North Carolina in order to insure a permanent supply of timber for our own use. He urged that the State provide a forest fire protective system; State forests for demonstration purposes; and a State forest nursery to provide forest tree seedlings at cost. Fire protection, however, he emphasized as of first importance.

Representatives of four out of the five large railroads of the State spoke, strongly endorsing the campaign for forest protection, and promising cordial cooperation in publicity work.

A number of others spoke on various phases of forestry work in the State.

Mr. Nathan O'Berry of Goldsboro, President of the North Carolina Pine Association, was elected President of the Forestry Association for the ensuing year. Mr. J. S. Holmes of Chapel Hill was reelected Secretary-Treasurer.

A Forester's Directory

The American Forestry Association wishes to compile and to keep up to date, a directory of foresters, in the United States, its possessions, Canada and Mexico.

This will be of considerable benefit to the members of the profession, as the Association is frequently asked for information concerning the whereabouts of foresters, and is also often asked to recommend foresters for various positions.

The American Forestry Association therefore requests each forester, whether he is a member of the Association or not, to send his full name, address, name of school or schools of which he is a graduate, and the feature, if any particular one, of his profession, in which he specializes.

This directory will be kept up to date from year to year, and will be available for any inquirers at any time.

THIRTY-FOURTH ANNUAL MEETING

DEPARTING from its usual plan of holding the annual meeting in Washington the American Forestry Association held its 34th annual session in New York City on January 11th, and the change met with great favor among the many members in New England, New York, New Jersey, Pennsylvania and other contiguous territory who were but seldom able to get to Washington for a meeting.

There was a gratifyingly large attendance and much enthusiasm over the work of the Association and what it has been able to accomplish, while the papers and discussions during the day resulted in many admirable suggestions for the activities of the Association during the present year.

The officers elected are:

President, Dr. Henry S. Drinker, president of Lehigh University, who was reelected.

New Vice-presidents: Hon. Wm. H. Taft, former president of the United States; Hon. John W. Weeks, U. S. Senator from Massachusetts; Hon. George Pardee, former Governor of California; Mr. Theodore L. Bristol, former president Connecticut State Forestry Association; and Mrs. Emmons Crocker, of Fitchburg, Mass., former chairman of the Conservation Department of the General Federation of Women's Clubs.

Treasurer, John E. Jenks. Washington, D. C., reelected.

Directors—for three years—W. R. Brown, Berlin, N. H.; John E. Jenks, Washington, D. C.; Charles F. Quincy, New York City; E. A. Sterling, Philadelphia; and Capt. J. B. White, Kansas City, Mo.; all reelected.

Director—for two years—William B. Greeley, Washington, D. C.

Auditor—E. A. Sterling, Philadelphia, reelected.

President Drinker reported that the financial statement for the year, which was being examined by the auditing committee, showed that the Association was sound financially and without any debts.

The Secretary's report in brief was as follows:

"Nineteen hundred and fourteen was marked by considerable development work by the Association. A campaign was successfully conducted in Virginia for the passage of a State forestry law and the creation of a State forester; and the people of South Carolina, Alabama and Texas were aroused by publicity measures to a realization of the need of similar laws in their States. Texas organized a State Forestry Association, which, aided by the American Forestry Association, is now striving to get a forestry law passed by the Legislature. A draft of a model forestry law was prepared for Game and Fish Commissioner John H. Wallace, of Alabama, and is embodied in his recommendations to the Legislature. The Association also cooperated in the organization of some county and township forest conservation and fire protective associations. There was a marked increase in requests for advice and information about trees, woodlots and forests from all over the country, indicating not only an increase in interest but extension of the knowledge of the work the Association is doing. Forest schools were supplied with valuable unpublished reports of the Forest Service needed for their libraries, and to a number of schools, societies and individuals was sent information relating to forest conservation.

"Among other features of the Association's educational work was the maintenance of a booth and the distribution of forest literature at the Forest Products Expositions at Chicago and New York, and the addresses on forestry at the Chautauqua, New York assembly, were valuable. Another feature of this work is the wide publication in magazines and newspapers during the year of articles about the Association and its work, and the republication of illustrations and articles from AMERICAN FORESTRY in some of the leading magazines of the country.

"During the year the Association acquired in E. T. Allen, Forester of the Western Forestry and Conservation Association, a Pacific Coast representative, and in Ellwood Wilson, of the Society of Canadian Forest Engineers, a Canadian representative, and the articles they have written and secured for the magazine have added much to its value.

"The Association authorized a bond issue of $50,000 to provide funds for the further improvement of the magazine and increase in its circulation. $16,000 has been subscribed and $14,000 has been paid in. $7,000 of this amount was personally secured by President Henry S. Drinker from some friends of forestry.

"Considerable improvement was made in the magazine during the year, better paper, more and better illustrations, a picture cover and a number of special articles adding greatly to its attractiveness and its educational value. Thanks are due to Mr. Charles Lathrop Pack for a donation of $1,000, and to J. B. White for a donation of $100, to aid in paying for these improvements.

"The Association is now in a solid condition financially, ending the year without one cent of indebtedness, and having a growing surplus invested in bonds.

"One thousand three-hundred and seventy-eight new members and subscribers were secured during the year, while deaths, resignations and members dropped for non-payment of dues totaled 1,012, making a net gain for the year of 366."

The day was devoted to hearing practical addresses and discussions on what the American Forestry Association might do in furthering its work in various directions, and these suggestions, many of them being most valuable, will be carefully discussed and considered by the Executive Committee. The addresses were by Henry S. Graves, chief forester of the United States; C. R. Pettis, forest superintendent of New York State; R. S. Kellogg, secretary of the National Lumber Manufacturers Association; George N. Ostrander of Glen Falls, N. Y., who is identified with the paper pulp and paper business; Dean Hugh P. Baker of the New York State College of Forestry at Syracuse; Prof. S. N. Spring, of the forestry department of the New York State College of Agriculture at Cornell; Warren H. Miller, editor of *Field and Stream*, Wm. B. Howland, publisher of the *Independent;* John O. LaGorce, associate editor of the *National Geographic Magazine;* Prof. H. H. Chapman of the Yale School of Forestry. Discussions followed and there was general participation in them with the result that every one present was much impressed and pleased by the practical suggestions for the kind of work which the Association might do.

President Henry S. Drinker presided at the morning session and E. A. Sterling at the afternoon session, while in the evening Charles F. Quincy of New York was toastmaster at the annual dinner at the Hotel McAlpin where addresses were made by Chief Forester Graves, Ottomar H. Van Norden of the Camp Fire Club of America, Hon. Cabot Ward, president of the Park Board of New York, who represented Mayor Mitchel; Dr. B. E. Fernow of the University of Toronto, President Henry S. Drinker of the American Forestry Association; and Dr. J. T. Rothrock of Pennsylvania.

THE INDEX FOR VOLUME TWENTY

OF THE AMERICAN FORESTRY MAGAZINE IS NOW READY AND WILL BE SENT UPON REQUEST TO ANY DESIRING IT

EDITORIAL

FORESTRY LAWS AND LEGISLATION

AT THIS season, during the sessions of the National Congress and of the legislatures of the different States, many measures of vital importance to forestry are being considered, some of which are good and some bad. The beneficial legislation should pass; the injurious measures must be vigorously opposed. But how are congressmen and legislators to distinguish good forestry laws from bad? The American Forestry Association assumes that forestry itself is good—that its necessity is proved and its benefits demonstrated. Good laws, on this basis, are laws which promote forestry and make it possible to grow trees successfully, whether under National, State or private management.

The experience of a century in Europe and of two decades in this country has indicated the conditions demanded for successful forest production. Two requisites are fundamental—forest land set aside for tree growth and a body of foresters independent of party politics, trained in their profession, and employed permanently to develop the forest and bring the work to a successful conclusion. The development of the actual practice of forestry on the National Forests is due wholly to the personal ability and training of the men who compose the present Forest Service. In the fourteen years preceding 1905, when these lands were under the United States Land Office, practically no development took place. Whatever has been accomplished since then is due to their transfer to the Department of Agriculture, under the management of Gifford Pinchot and Henry S. Graves, trained foresters.

Any measure which proposes to remove these National Forests from the control of the trained organization of the Forest Service, whether by transfer to some other Government bureau or by grants of additional lands to Western States, strikes at the fundamental condition which promises efficient forest management.

This is a defect in Secretary of Interior Lane's proposed plan for a local commission to govern Alaska which may be overcome by the appointment of a forester or a man capable of efficient forest management as a member of the commission, as well as the understanding that the forests shall be administered in the same efficient manner as under the Forest Service, and with the Forest Service acting in a close advisory capacity.

Reprehensible is H. R. Bill 1602, which proposes to throw open for homestead settlement all lands now protected by National ownership which have especial value for recreation. Under the guise of "summer homesteads" this bill permits the private acquisition of camping sites, lake shores and other lands of inestimable future value to the public.

In the class of good legislation before Congress falls the appropriation to continue the work undertaken through the Weeks Law—the purchase of additional lands in the Appalachians and

White Mountains. This measure receives the unanimous support of the Eastern States, and no plea of economy should suffice to interrupt this work. Congress is asked to continue the annual appropriation of $2,000,000 until 1920, and the constituents of Congressmen within these States must make plain their hearty approval of this enterprise.

Meanwhile, forestry legislation in several States demands attention. The most serious aspect of State forestry today is the need for the establishment of a strong and efficient State forest service similar in character to that of the National Government, and based on merit and training. Several States, notably Minnesota, have secured this result by giving the control of the work to a non-partisan board whose sole responsibility is forestry. In other States, the State work been the cat's-paw of party politics, and in some by a short-sighted policy of pretended economy, this work has been combined with the administration of the fish and game laws, with the conservation of minerals and even with the problem of waterpower. The public is led to believe that this consolidation is satisfactory where tried. We speak with full knowledge of the facts in stating that it is decidedly unsatisfactory. There is a limit to the capacity of a board, and the administration of forestry laws is all that can be properly attended to by one commission. When to this duty is added the control of the game warden system, and other functions, forestry suffers proportionately.

Facts speak for themselves. Under the consolidated Forestry, Fish and Game Commission of New York but one out of the entire list of commissioners ever gave any special attention to forestry—and New York stands today where she was twenty years ago, prohibiting cutting of timber on forest lands of the State. Under the more recent consolidation by which waterpowers were added to the duties of the Conservation Commission, even the time-honored policy of purchasing lands has been allowed to lapse, solely through loss of initiation in the Commission. The State is now struggling to secure the non-political reorganization of this department which must precede any attempt at the practice of forestry by constitutional amendment.

As a result of the creation of a Public Domain Commission in Michigan combining the functions of a board of Forestry with that of Immigration, and Public Lands, the Commission suffered a marked loss of initiation in forestry.

Louisiana, under a Conservation Commission which combines fish and game protection with forestry, has failed to even make a beginning in the creation of a State forest service, and is expending almost her entire appropriation on fish, game and minerals. Oregon, formerly under this form of organization, has taken her forest fire service out of the hands of the Fish and Game Commission in order to get results. New England is a unit in support of separate forest organizations. New Jersey, Maryland, Ohio, and the Western States of Montana, Idaho, Washington and California believe in separate forestry boards. And in this list of States are included practically all which have laid the foundations of a sound State policy by the employment of foresters on a permanent basis.

On this evidence we claim that measures looking to the consolidation of other State departments with forestry are bad. The Legislature of Wisconsin is now considering such a measure. For a decade the forestry affairs of the State have been managed by a non-partisan board. It is now proposed to supersede this board by one appointed by the Governor, which shall combine public lands, and fish and game with forestry. One advocate of this plan cites Michigan and New York as examples, and claims that the measure is in line with a general tendency. If passed, it can have but one result—the definite relegation of the forestry work of the State to a subordinate position, similar to the conditions prevailing in Michigan, New York and Louisiana.

Alabama, after eight years of trial of this combined forest, fish and game commission, and a complete dearth of results, is this year considering the

establishment of a separate forestry board—such a measure should pass. Texas is planning to create an entirely independent forestry commission. In Pennsylvania the work of the Forestry Commission has been separate from all other forms of State activity from its origin, and the great progress of the State through the purchase and management of forest lands, and the establishment of a State Service, is due almost wholly to this fact. Specialization, not consolidation, must be the watchword of American forestry, if we are to accomplish any practical results within the next decade.

WITH THE FORESTERS

Mr. C. S. Judd, who for several years has been connected with the United States Forest Service as Assistant District Forester in the office of Silviculture at Portland, Oregon, has recently resigned to accept the position of Forester for Hawaii and Executive Officer of the Board of Agriculture and Forestry there. Mr. Judd assumed his new duties on January 15th.

R. Brooke Maxwell, city forester of Baltimore, writes that the Division of Forestry of Baltimore has been fortunate enough to secure a slight increase in its working funds for this season. The increase was $5,000, making the total appropriation for tree work $12,900. The value of the work which the department has been trying to do seems to be appreciated, and this present increase is only the beginning of larger and better things.

The Board of Governors of the National Lumber Manufacturers' Association has accepted the resignation of Mr. J. E. Rhodes as secretary and he has become secretary of the Southern Pine Association. Mr. R. S. Kellogg, secretary of the Northern Hemlock & Hardwood Manufacturers' Association, has been elected secretary to succeed Mr. Rhodes.

Mr. H. H. Tryon, a graduate of Harvard College and the Harvard Forest School, has been appointed an instructor in Forest Utilization at the New York State College of Forestry at Syracuse. This appointment has been made to handle the greatly increased work in the Department of Forest Utilization.

Prof. Nelson C. Brown represented the New York State College of Forestry at Syracuse at the annual meeting of the American Wood Preservers Association in Chicago, January 19, 20 and 21. Dean Hugh P. Baker and Prof. Brown are both members of the Association.

Dr. C. A. Schenck, former director of the Biltmore Forest School, is alive and well, and the news will be welcomed by his many friends in this country who have recently heard the unconfirmed rumor that he was killed in action while leading an attack on the Russians in Poland. Dr. Schenck, who is an officer in a German Regiment, has been in the campaign in Poland since early in the fall. On Dec. 18th, Mrs. Schenck, according to advices received here, heard that he was in good health and unwounded. A few days later he was seriously wounded. But on Jan. 8th, he had so far recovered that he was preparing to return to the front.

In writing to J. Gordon Dorrance, a forest engineer in the Maryland State Forestry Department, Dr. Schenck said: "Thank God, by some miracle I am up and well again, ready to go back to my regiment. Of course, no one of the Biltmore students expected me to stay behind when my country was in danger, and I am sure that all Biltmoreans will do the same when the good old U. S. A. is at war."

Coert Du Bois, district forester with headquarters in San Francisco, spent several days in Washington in January in relation to affairs in his district.

Gifford Pinchot is now in England where with Mrs. Pinchot he is aiding his sister, the wife of Sir Alan Johnstone, British minister to the Netherlands, in relief work. He expects to remain abroad for some months.

W. B. Greeley, assistant forester with headquarters in Washington, D. C., has been elected a director of the American Forestry Association for a term of two years.

News print paper has been made by the Forest Service laboratory from 24 different woods, and a number compare favorably with standard spruce pulp paper.

The Forest Service is cooperating with 54 railroads, mining companies, pole companies, and cities in making tests of wooden ties, timbers, poles, piling, and paving blocks which have been given preservative treatments.

Recent sales by the government totaling 126,000,000 feet of saw timber in the Olympic National Forest, in western Washington, mark the opening of this hitherto inaccessible storehouse of timber, estimated to contain a stand of 33 billion board feet.

THE CANADIAN DEPARTMENT

By ELLWOOD WILSON

AMONG the New Year's honors this year are two of interest to Forestry. The head of the Canadian Conservation Commission has been made Sir Clifford Sifton. Sir Clifford has done much to make the Conservation Commission efficient and its work is bound to have a great influence in the development of Canada.

Mr. William Price, the head of Price Bros. Ltd., Paper Manufacturers and holders of one of the largest timber limits in the Province of Quebec, has been made Sir William Price. He was instrumental in organizing and laying out the Camp at Valcartier near Quebec for the First Canadian Contingent and it was in large measure due to him that the whole camp was so efficiently organized. His firm is the only one in Canada to have its limits insured against fire, this insurance having been placed in England. The limits are insured in separate blocks, and there must be a loss of at least $50,000 before the insurance company will settle for damage. This insurance is probably the reason why this large company has never joined the local cooperative Fire Protective Association.

The building for the Dominion Forests Products Laboratory in connection with McGill University is approaching completion and the experimental machinery which has already been delivered will soon be installed. Messrs. Bates and Campbell, the Director and Assistant, read papers before the last meeting of the Montreal Section of the Society of Chemical Industry.

Capt. J. B. White, Manager of the Woodlands Department of the Riordan Pulp & Paper Co., and the Canadian Member of the National Lumber Manufacturers Association, expects, if his military duties will permit, to attend the meeting of the American Forestry Association in New York. Capt. White has been in charge of guarding some of the canals in the neighborhood of Montreal.

Mr. D. C. A. Galarneau, Forester for the Algoma Central & Hudson Bay Railway, has a little daughter.

Mr. R. D. Prettie, Chief Forester for the Canadian Pacific Railway, has just returned from a trip to the Pacific Coast where he attended the meeting of the Northwestern Forestry and Conservation meeting.

Mr. H. R. MacMillan, Chief Forester of British Columbia, will read a paper before the Conservation Commission at its meeting in Ottawa on the Organization of a Fire Protective System, and

before the Society of Canadian Forest Engineers on Organizing a Provincial Forestry Service.

The Canadian Forestry Association will hold its Annual Meeting in Ottawa on the 19th and 20th of January, as will also the Society of Canadian Forest Engineers. These two Societies usually meet in February but the meetings will be held as above so as to coincide with that of the Dominion Conservation Commission.

Mr. F. McVickar, of the Canadian Society of Forest Engineers, is serving in the British Army with the First Canadian Contingent.

Mr. Stetson, of the West Virginia Pulp and Paper Company while on a visit to Montreal last week, said that his company now had a plant in operation for making denatured ethyl alcohol from sulphite waste liquor and that it was a profitable commercial enterprise. His company controls the patents for the United States.

The Lumbermen and Members of the wood working industries in the neighborhood of Ottawa have formed a Safety Association to prevent accidents to their employees and will incorporate under the Ontario Companies Act. This is in accordance with the privileges granted by the Ontario Workman's Compensation Act.

Sir Thomas Shinner, Governor of the Hudson's Bay Company and a Director of the Canadian Pacific Railway, has become a Director of the Laurentide Company, Ltd.

The Forestry Department of the Canadian Pacific Railway which has been in charge of Eastern Lines, i. e., from Lake Superior to the Atlantic Coast, has been transferred from the Department of Natural Resources to that of Operating and under the General Manager, Mr. A. D. MacTier, has done splendid work toward eliminating fires along the right of way. The Forestry work is in charge of Mr. B. W. Winegar and is being conducted along liberal and broad-minded lines. Damage claims have been very numerous in the past and an effort will be made this coming season to eliminate them entirely. The C. P. R. has become a member of the Kennebec Valley Fire Protective Association in Maine. Their claims for the past year totaled $600,000 and caused a great deal of trouble. The following work is being done. All section men must fight fires and all train crews must report fires discovered at the first station. During dangerous times and along dangerous stretches extra patrolmen are used. Help is given to adjacent owners on the right-of-way in extinguishing fires. The Railway Commission's Fire Service is cooperated with and also all Provincial Agencies. After fires are extinguished, crews of trained men are sent to assess the damages, which are ascertained by strip surveys, growth studies, careful maps of the areas and so forth. They then offer to settle on the basis of actual damage. In this way a great deal of money is saved and fraudulent claims are eliminated.

As showing what can be done along these lines, the celebrated "Carter Case" may be cited. This was a claim for damage said to have been caused by a fire originating on the C. P. R. right-of-way, the amount asked being $358,000. In the investigation of this claim twenty-two men were engaged for eight months and the area burned was most carefully gone over with the result that the damage was determined to have been $2,500 and on this amount the Company settled. One of the investigating party, Mr. Porter Shaw, was unfortunately drowned.

FOREST NOTES

The Public Domain Commission of Michigan has made arrangements with the U. S. Department of the Interior to secure a herd of twenty-five Elk for the State of Michigan. These will be brought from the Yellowstone National Park and placed on the Houghton Lake State Forest, in Roscommon County. This Forest affords an extensive range, and very favorable conditions as to natural forage and shelter for this species of deer. It is therefore expected that these animals will do quite well here and increase rapidly. Should the venture prove a success, other of the larger State Forests in both the Lower and Upper Peninsulas will be stocked from the increase of the herd and in time these places may become sources of big game supply for the entire State.

The State Board of Forestry in Maryland is preparing this winter a detailed report of the annual lumber production in that State. This estimate is being based on the cut of 1,100 timber operators in Maryland as sent in by them to the Board, and will give the amount of lumber and timber they are getting out annually in different products—lumber, ties, piling, poles, etc. These reports, combined with those made of preceding years, will give an accurate idea of the extent of the timber business in Maryland. Later this information will be combined with other data showing how this material is utilized by the numerous wood-working industries of the State, with its value in the rough and finished states of production.

Winter weather has not prevented the carrying out of work under the Roadside Tree Law, and the Board of Forestry has a large force of State Wardens in the field engaged in the supervision of public tree work. Orders for stock from the recently established State Forest Nursery are being received for spring planting. A large amount of reforestation work was done a year ago, and this year, with a well-stocked nursery supplying suitable planting stock at cost, it is planned to make an even better record in planting up the State's waste lands.

The New York State College of Forestry at Syracuse University has placed an order for several models to be used in its exhibit at the Panama Exposition. There will be three relief map models of an area in the Adirondacks including Whiteface Mountain. The first will represent the area with its original covering of virgin forest; the second will show the same area cut over, burned and eroded; and the third will show the area reforested by plantings.

A fourth model will depict the activities of the State College of Forestry. It will be a relief model of an imaginary area. In the center will be the College of Forestry with lines leading to the forests of the State, the State Ranger School, the villages, cities, high schools, farms, etc., of the State.

The New York State College of Forestry has just moved its summer school equipment from its property in the Catskills to the Adirondacks. It has been decided to have the next summer school in the Adirondacks and of three months' duration. This will result in some very valuable data being gathered regarding the State forest lands in the Adirondacks.

B. F. Porter, a timber and lumber operator of Eureka, California, recently felled a redwood tree on his tract that equaled the record value of any yet cut in California. It was 380 feet high, 26 feet in diameter 7 feet from the ground, 261 feet to the first limb, where the diameter was 11 feet, and scaled over 344,000 feet of lumber. Fifty per cent. will sell at $35, 30 per cent. at $18, and the remaining refuse at $8. The total value is estimated at more than $9,000.

The Hammond Lumber Company is cruising the immense timber holdings of the Metropolitan Redwood Lumber Company in the Humboldt district, California. Some of the holdings of this company are the finest in California, there being single acres that will cruise 1,000,000 feet and 100-acre tracts that will average 750,000 feet to the acre.

Governor Whitman of New York in his inaugural address puts himself on record as being in favor of keeping the various divisions of the conservation department separate. He says: "The conservation department as at present organized has three divisions:

"First. A division of lands and forests;

"Second. A division of inland waters, covering water supply, water storage, drainage, navigation, etc.;

"Third. A division of fish and game.

"It is very important, in my opinion, that the work of these three divisions should be kept entirely separate and that each of these divisions should have an expert administrative head, who is specially qualified by training and experience to do the work as it ought to be done. The actual administration of the work of each one of these divisions can be properly done only by a man who is familiar with the special line of work and has had really sound training and experience along these lines. For these reasons I favor three separate bureaus or divisions in the department, and I think that it is most important that the law should specifically provide that the head of each bureau or division should be a trained expert."

Only 7½ per cent. of last season's 400 fires in National Forests of Utah, southern Idaho, western Wyoming, and Nevada caused losses in excess of $100.

There were 400 fires this year on the National Forests of Utah, southern Idaho, western Wyoming, and Nevada, or 15 more than in the most disastrous season of 1910. Yet the cost of extinguishing them was only one-third and the damage only one-thirtieth of that of the earlier year. The difference is due to better organization now, and to more roads, trails, and telephones.

Only one modern sawmill is operated in the territory of Hawaii.

In District 4 of the Forest Service, with headquarters at Ogden, Utah, lightning caused 36 per cent. of this year's fires and campers 27 per cent.

As showing the possibilities for tree growth in regions where irrigation has to be depended upon, it is pointed out that Boise, Idaho, has as many as 94 different kinds of ornamental and shade trees.

The Laurentide Company of Quebec, producers of pulp and pulpwood, is reforesting its non-agricultural cut-over lands. It is also importing reindeer from Newfoundland, to see if they can take the place of dogs in winter woods work.

A small railroad operating an oil-burning locomotive on the Tahoe national forest, California, had a breakdown during the past summer and burned wood instead of oil for one day. On this day fifteen fires started along the right of way. During the preceding year only one fire occurred near the railroad and it was not thought that the engine was responsible for that one.

Lodgepole pine, one of the principal trees of the Rocky Mountains, makes good strong wrapping paper and pulp board.

Osage orange wood is a source of dye and can be used to supplement the imported fustic wood, as a permanent yellow for textiles.

During the past two years forest officers have killed nearly 9,000 predatory animals, more than three-fourths of which were coyotes.

BOOK REVIEWS

FOREST VALUATION. pp. 310. By Herman Haupt Chapman, John Wiley & Sons, Inc. New York. $2.00.

With the development of forestry in this country has come an increasing demand for definite information concerning the value of standing timber, mature and immature, of forest soil, and of the forest as a whole. Professor Chapman's book affords the means for determining these important points and for answering such perplexing questions as: Does forestry pay? Is forest property a good investment? How shall young timber be valued? How shall damages to standing timber be appraised? How are stumpage values accurately determined? What is the basis for deciding whether a given tract is chiefly valuable for agriculture or for forest production?

The reader of this book will realize that contrary to common belief these problems are not in a class by themselves but are solved in much the same manner that all values are determined, for the principles of forest valuation are shown to be in strict accord with the customs and principles of ordinary business accounting. The chief distinction is that forest valuation is concerned with much longer periods of time than are most financial calculations.

In order that the student or reader may fully appreciate these relationships the first four chapters of this book are devoted to a résumé in simple terms of the general principles underlying economics. Especial emphasis is laid upon the theory and application of compound interest as a mathematical means of determining value.

To the layman as well as to the average student the presence in a book of many seemingly complex formulae is likely to give the impression that the subject is too difficult for them to master. If, however, the introductory chapters of the present volume are carefully read and the significance of the mathematical symbols is once understood this difficulty vanishes. The subject demands thought, to be sure, but if the reader is reasonably painstaking in the beginning he will be surprised at the readiness with which he is able to grasp the subsequent details.

This book is designed with special reference to the needs of American conditions. Instead of emphasizing, as most European treatises on the subject do, the determination of the expectation value of forest soil, greater consideration is given to matters of more practical import here, such as stumpage values, sale values, and appraisal of damages. No problems have been included in the text, apparently on the assumption that if the principles underlying them are fully understood such problems can be readily supplied and solved by the instructor or reader.

Teachers and students in forest schools and others who are interested in this important subject will welcome this book for it is the first American treatise on forest valuation to cover the field in a manner at once comprehensive and simple. S. J. R.

PRESERVATION OF STRUCTURAL TIMBER. Howard F. Weiss. (McGraw-Hill Book Co., New York.) Price $3.00.

The wood preserving industry has long been looking for a compilation of existing information, and this Mr. Weiss has supplied in his new book, "The Preservation of Structural Timber." The arrangement of the subjects and chapters is logical, and to the uninitiated a reading of the book gives practically the whole story of wood preservation. The chapter on Causes for the Deterioration of Structural Timber is particularly to be commended, and under the heading of Decay a very large subject has been well summarized.

The chapter on Construction and Operation of Wood Preserving Plants outlines briefly the general forms of construction, but will be of little value to the inexperienced man in search of information on specifications and details. In fact the illustrations in some cases are of plants and devices which are considered out of date.

One looks in vain in this book, as in all current literature on the subject, for some of the essential facts regarding the relation of treatment to service requirements, and as to the influence of various local conditions on the life of treated material. Mr. Weiss is to be commended for avoiding many of the technical points on which it is so easy to split hairs without getting anywhere, and also on quoting specifications of the American Railway Engineering Association for creosote, rather than the unaccepted division of temperatures and fractionation of the Forest Service.

On the whole, Mr. Weiss' book is a very valuable compilation of engineering knowledge on the subject of timber treatment. It is but natural that the findings of the Forest Products Laboratory and the various publications from the same source are given prominence, since Mr. Weiss has been the author of some of the most acceptable government bulletins, and his knowledge of the wood preserving industry comes largely through a laboratory acquaintance with many of the problems.

STUDIES IN TREES, J. J. Levison, forester to the Department of Parks, Brooklyn, N. Y. (John Wiley & Sons, Inc., New York) $1.60.

The author is one of the pioneer trained foresters to specialize in the care and planting of ornamental and shade trees and his intimate knowledge of the subject as well as his understanding of the students needs are in accord with his varied experiences as forester for the Brooklyn Park System, as lecturer on ornamental and shade trees at Yale University and as Secretary of the American Association of Park Superintendents.

The book covers the whole range of tree study including the identification of trees; their nature, habits and growth; insects and diseases which attack them; their grouping and planting; the pruning and care of trees; the identification of commercial woods; the care of the woodlot and Forestry in its many aspects.

The treatment is concise, systematic and free from an undue use of botanical terms. The author's aim throughout is to give only the salient points and to so present his text that the reader is enabled to reach at a glance, the main features of the subject under discussion.

SONG OF SERVICE, by Charles H. Mackintosh (M. I. Stewart Co., Duluth, Minn.) $1.00.

The author is the versatile editor of *Steam Machinery* and the book is an artistic little volume of excellent verse which may earn for Mr. Mackintosh the title of "The Omar Khayyam" of the willing workers, those who serve. Note the first verse:

"Who loves must serve, and we who love our kind
Must also serve them, serve with hand and mind;
Thus only may we live not all in vain;
Thus only may we hope to live again."

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